

PEST MANAGEMENT ALLIANCE PROJECT FINAL REPORT

The California Winegrape Pest Management Alliance Project

Agreement Number 00-0208S

Karen Ross, Principal Investigator
California Association of Winegrape Growers
601 University Avenue, Suite 135
Sacramento, California 95825
(800) 241-1800 telephone
(916) 924-5374 fax
karen@cawg.org

August 31, 2002

*Prepared for the California Department of Pesticide Regulation
by Joe Browde, Consultant*

DISCLAIMER

The statements and conclusions in this report are those of the contractor and not necessarily those of the California Department of Pesticide Regulation. The mention of commercial products, their source, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products.

ACKNOWLEDGMENTS

Numerous individuals and organizations have contributed to the success of this project over two years. Therefore, it is somewhat of an injustice to identify certain contributors at the risk of failing to credit others. Nevertheless, a number of people and organizations were and continue to be integral to the success of the project. This includes members of the Winegrape Pest Management Alliance Management Team (**Table 1**) – Kendra Baumgartner, Larry Bettiga, Jeff Bitter, Mike Boer, Jenny Broome, Jeff Dlott, Nick Fry, Patrick Gleeson, Kurt Hembree, Rhonda Hood, Jon Holmquist, Steve Kautz, Randy Lange, George Leavitt, David Lucas, Kelly Maher, Mario Moratorio, Julie Nord, Kris O'Connor, Cliff Ohmart, Steve Quashnick, Jason Smith, Katey Taylor, Lori Ann Thrupp, Ed Weber, and Ken Wilson. Also, the Department of Pesticide Regulation liaison for the project, Sewell Simmons, has provided invaluable support.

The contribution made by grower-cooperators cannot be overstated. The transfer of information from grower to grower is the foundation for the project's success. Formal grower-cooperators include Frank Alviso, Dennis Atkinson, Hector Bedolla, Eddie Bolt, Alan Butterfield, Martin Carrillo, Steve Carter, Bill Chandler, Steve Christy, John Diener, Ben Drake, Ed Franceschi, Bruce Fry, Kirk Grace, Bart Haycraft, Jon Holmquist, Mark Houser, Ray Jacobsen, Craig Macmillan, John Maffeo, Ron Metzler, Roger Moitoso, Gerald Neuwirth, Julie Nord, Tom Piper, John Rauck, Leland Rebensdorf, Ed Rosenthal, Rich Smith, Katey Taylor, Bob Thomas, Barbara and David Uhlich, Joe Valente, Craig Weaver, Mark Welch, and Gary Wilson (**Table 2**).

It is important to identify a number of wineries that helped sponsor field days and workshops and otherwise supported the project. These include Bronco, Canandaigua, Domaine Chandon, E & J Gallo, Fetzer, Kendall-Jackson, and Robert Mondavi.

Finally, it is essential to thank the leadership of the California Association of Winegrape Growers for recognizing the importance of this project for further establishing California's winegrape industry as leaders in sustainable agriculture and helping sustain the future of viticulture in California. Without their financial support, the project could not have been a reality.

This report was submitted in fulfillment of DPR agreement 00-0208S for the California Winegrape Pest Management Alliance Project by the California Association of Winegrape Growers under the partial sponsorship of the California Department of Pesticide Regulation. Work was completed as of August 31, 2002.

Table 1. Winegrape PMA Management Team

Kendra Baumgartner , USDA-ARS One Shields Avenue Department of Plant Pathology Davis, CA 95616 (530) 754-7461 kbaumgartner@ucdavis.edu	Larry Bettiga , UC Coop Extension Viticulture Farm Advisor 1432 Abbott Street Salinas, CA 93901 (831) 759-7350 lbettiga@ucdavis.edu	Jeff Bitter , Allied Grape Growers 3475 West Shaw Ave, Suite 103 Fresno, CA 93711 (559) 276-7021 jeff@alliedgrapegrowers.org
Mike Boer , AG Unlimited Mendocino Winegrowers Alliance 300 Stipp Lane Ukiah, CA 95482 (707) 468-8154 pirtpete@pacific.net	Jenny Broome , UC SAREP One Shields Avenue DANR Building – Hopkins Road Davis, CA 95616 (530) 754-8547 jcbroome@ucdavis.edu	Joe Browde , Private Consultant 710 Mayflower Street Petaluma, CA 94954 (707) 776-4943 mjbrowde@pacbell.net
Jeff Dlott , RealToolbox 7600 Old Dominion Court, #6 Aptos, CA 95003 (831) 786-0994 jeff@realtoolbox.com	Nick Frey , Sonoma County Grape Growers Association 5000 Roberts Lake Road, Suite A Rohnert Park, CA 94928 (707) 206-0603 frey@sonic.net	Patrick Gleeson , American Vineyard Foundation P.O. Box 414 Oakville, CA 94562 (707) 967-9307 patrick@avf.org
Kurt Hembree , UC Coop Extension Weed Farm Advisor 1720 S. Maple Avenue Fresno, CA 93702 (559) 456-7556 kjhembree@ucdavis.edu	Rhonda Hood , North Coast Grape Growers Association 970 Piner Road Santa Rosa, CA 95403 (707) 578-8331 vinovine@sonic.net	Jon Holmquist , Canandaigua Wine Company P.O. Box 99 Madera, CA 93639 (559) 661-5539 jon.holmquist@cwine.com
Steve Kautz , Ironstone Vineyards Calaveras Wine Association 5490 Bear Creek Road Lodi, CA 95240 (209) 334-4786 speyrod@goldrush.com	Randy Lange , Twin Oaks Vineyards CAWG 1298 West Jahant Road Lodi, CA 95220 (209) 339-4055 langetwn@inreach.com	George Leavitt , UC Coop Extension Viticulture Farm Advisor 328 Madera Avenue Madera, CA 93637 (559) 675-7879 ext 206 gmleavitt@ucdavis.edu
David Lucas , Lucas Winery Robert Mondavi Winery 18196 N. Davis Road Lodi, CA 95242 (209) 368-2006 david@lucaswinery.com	Kelly Maher , Domaine Chandon Napa Valley Grape Growers One California Drive Yountville, CA 94599 (707) 738-0350 kellym@napanet.net	Mario Moratorio , UC Coop Extension Farm Advisor 740 Castlewood Court Suisun, CA 94585 (707) 421-6793 msmoratorio@ucdavis.edu
Julie Nord , North Coast Vineyard Services 1326 Hill View Lane Napa, CA 94558 (707) 226-8774 ncvs@aol.com	Kris O'Connor , Central Coast Vineyard Team P.O. Box 248 Atascadero, CA 93422 (805) 462-9431 info@vineyardteam.org	Cliff Ohmart , Lodi-Woodbridge Winegrape Commission 2545 West Turner Road Lodi, CA 95242 (209) 367-4727 COhmart@aol.com
Steve Quashnick , Quashnick Farms CAWG 5727 E. Woodbridge Road Acampo, CA 95220 (209) 369-9202 squash@lodinet.com	Karen Ross , President CAWG 555 University Avenue, Suite 250 Sacramento, CA 95825 (800) 241-1800 karen@cawg.org	Sewell Simmons , DPR Pest Mgt and Licensing Branch 1001 I Street, P.O. Box 4015 Sacramento, CA 95812 (916) 324-4245 ssimmons@cdpr.ca.gov
Jason Smith , Valley Farm Mgt Monterey County Grape Growers P.O. Box Drawer A Soledad, CA 93960 (831) 678-1592 jason2313@aol.com	Katey Taylor , Domaine Chandon Napa Valley Grape Growers One California Drive Yountville, CA 94599 (707) 944-9400 ext 154 katey_taylor@chandon.com	Lori Ann Thrupp CMD-4 US EPA REGION 9 75 Hawthorne Street San Francisco, CA 94105 (415) 744-1983 Thrupp.Loriann@epamail.epa.gov
Ed Weber , UC Coop Extension Viticulture Farm Advisor 1710 Soscol Avenue #4 Napa, CA 94559 (707) 253-4221 eaweber@ucdavis.edu	Ken Wilson , Wilson Farms Clarksburg Wine Growers Assoc P.O. Box 307 Clarksburg, CA 95612 (916) 744-1456 Kenneth@wilson-farms.com	

Table 2. Winegrape PMA Grower-cooperators.

Individual	Demo Vineyard Location – Winegrape Region (County)	Reduced-risk Pest Mgt Target
Frank Alviso	Northern Interior (Amador)	Sulfur and Weeds
Dennis Atkinson	S San Joaquin Valley (Kern)	Weeds
Hector Bedolla	North Coast (Sonoma)	Weeds
Eddie Bolt	S San Joaquin Valley (Kern)	Weeds
Allan Butterfield	S San Joaquin Valley (Kern)	Sulfur and Weeds
Martin Carrillo	Northern Interior (Stanislaus)	Sulfur
Steve Carter	Central Coast (San Luis Obispo)	Weeds
Bill Chandler	S San Joaquin Valley (Fresno)	Weeds
Steve Christy	Northern Interior (Stanislaus)	Weeds
John Diener	S San Joaquin Valley (Fresno)	Weeds
Ben Drake	South Coast (Riverside)	Sulfur and Weeds
Ed Franceschi	Northern Interior (Sacramento)	Sulfur
Bruce Fry	Northern Interior (San Joaquin)	Weeds
Kirk Grace	North Coast (Napa)	Weeds
Bart Haycraft	Northern Interior (San Joaquin)	Sulfur and Weeds
Jon Holmquist	S San Joaquin Valley (Madera)	Weeds
Mark Houser	North Coast (Sonoma)	Sulfur
Ray Jacobsen	S San Joaquin Valley (Fresno)	Weeds
Craig Macmillan	Central Coast (Santa Barbara)	Sulfur
John Maffeo	Northern Interior (Stanislaus)	Weeds
Ron Metzler	S San Joaquin Valley (Fresno)	Weeds
Roger Moitoso	Central Coast (Monterey)	Sulfur
Gerald Neuwirth	S San Joaquin Valley (Fresno)	Weeds
Julie Nord	North Coast (Napa)	Sulfur and Weeds
Tom Piper	North Coast (Mendocino)	Sulfur and Weeds
John Rauck	North Coast (Sonoma)	Weeds
Leland Rebensdorf	S San Joaquin Valley (Fresno)	Sulfur
Ed Rosenthal	S San Joaquin Valley (Madera)	Sulfur
Rich Smith	Central Coast (Monterey)	Weeds
Katey Taylor	North Coast (Napa)	Weeds
Bob Thomas	Central Coast (Santa Barbara)	Weeds
Barbara and David Uhlich	Northern Interior (San Joaquin)	Weeds
Joe Valente	Northern Interior (San Joaquin)	Sulfur
Craig Weaver	South Coast (Riverside)	Weeds
Mark Welch	North Coast (Mendocino)	Sulfur and Weeds
Gary Wilson	S San Joaquin Valley (Kern)	Sulfur and Weeds

TABLE OF CONTENTS

Title Page.....	1
Disclaimer.....	2
Acknowledgments.....	3
Table of Contents.....	6
List of Figures & Tables.....	8
Executive Summary.....	9
Body of Report	11
Introduction	11
Results	15
Discussion.....	22
Summary and Conclusions	24
References.....	26
Appendices.....	28
<i>General</i>	
Timetable for Year Two	29
Winegrape Pest Management Alliance – Focus & Timeline.....	30
<i>Growers, PCAs, and Workers (sample events and surveys - year two)</i>	
PMA Field Day, Santa Rosa (flyer & agenda).....	31
Winegrape PMA Seminar & Field Day, Fresno (agenda)	32
PMA Field Day, Hopland (agenda).....	33
North Coast 2001 PMA Survey Results.....	34
Winegrape Field Event Survey & Evaluation Form (example).....	35

Hands-On Training for Pesticide Applicators, Napa (flyer).....	36
<i>General Public (sample events and related material - year two)</i>	
Packet of Guidelines for Napa Vineyard Open House Program.....	37
Suggested Guidelines for Lodi Public Education Events.....	44
A Stroll Through the Vineyard, Lockeford (flyer)	45
<i>Written Educational Materials (selected handouts, publications, and Instructor's guides – year two)</i>	
Overview – The California Winegrape PMA (handout – English).....	46
Overview – The California Winegrape PMA (handout – Spanish).....	47
Best Management Practices for Sulfur in Winegrapes (handout – English)	48
Best Management Practices for Sulfur in Winegrapes (handout – Spanish)	50
Sulfur Dust Stewardship and Safety (Instructor's Guide – English).....	53
Sulfur Dust Stewardship and Safety (Instructor's Guide – Spanish).....	58
Practical Neighbor and Community Relations (handout – English).....	63
CCVT Focus on Sulfur (article – Wines & Vines Magazine, Oct. 2001).	65
The California Winegrape PMA (article – 2002 Proc CWSS)	68
Herbicides Added to CAWG Program (article – W Farm Press, Feb. 2002)	71
Catching the Drift (article – California Farmer, June 2002).....	73
Winegrape PMA Field Day Goes Deep (article – Grape Grower Magazine)	77
Neighbor Outreach – It's Your Responsibility (article – newsletter).....	80
Pest Management Seminar and Field Day Held (article – newsletter).....	82
Vineyard Team Crosses Language Barrier (article – newspaper).....	83

LIST OF FIGURES & TABLES

Winegrape PMA Management Team	4
Winegrape PMA Grower-cooperators.....	5
Sulfur Drift Incidents by Crop (1997-99).....	13
Sulfur Drift Incidents for Grapes by Region (1997-99).....	13
Herbicide Uses in Winegrapes (1998).....	13
Higher-risk Herbicides Registered for Grapes.....	13
Tasks, Task Elements, and Responsible Individuals/Groups.....	14
Educational/Outreach Materials prepared during Year Two.....	17
PMA Field Events (Field Days and Workshops).....	19
PMA Non-field Events (Meetings and Workshops).....	20
Outside Presentations about PMA and Reduced-risk Practices.....	21

EXECUTIVE SUMMARY

This report covers those objectives, tasks, and activities related to the second year of the California Winegrape Pest Management Alliance Project (PMA), contract 00-0208S. A third year is underway.

PMA is a grower-driven partnership led by a prestigious and diverse Management Team consisting of a Steering Committee and Technical Advisors (**Table 1**). Overall leadership is provided by the California Association of Winegrape Growers (CAWG). In addition to direct funding from the California Department of Pesticide Regulation and CAWG, the project relies on a vast network of in-kind support, resulting from numerous partnerships established among growers, grower organizations, wineries, regulatory agencies, farm bureaus, extensionists, and researchers. Thirty six grower-cooperators help implement the project.

The overarching goal is to promote and increase the adoption of reduced-risk pest management in winegrapes throughout California. The project focuses on the top two statewide problems involving pesticide risks and winegrape production – 1) sulfur drift and 2) uses of herbicides either classified as groundwater contaminants or FQPA (1996 Food Quality Protection Act) priority I (highest risk) materials.

For year two, the specific objective was to continue and intensify a statewide program to demonstrate and expand outreach on sulfur best management practices and reduced-risk weed management. Key target audiences were growers and pest control advisors (PCAs), vineyard foremen and workers (although not stated in the original proposal), and the general public.

A systems-based approach was used to implement two major tasks: 1) demonstrate strategies and 2) expand outreach. Elements for demonstrating strategies were: (a) survey and compile updated information on region-specific sulfur best management practices and reduced-risk weed management, (b) update and refine educational material on reduced-risk practices for managing sulfur and weeds, (c) retain grower-cooperators from year one and recruit additional cooperators to demonstrate reduced-risk practices, (d) implement reduced-risk options at demonstration vineyards, (e) organize and hold field events in each region, and (f) document vineyard practices at demonstration sites, field event participation, and other evaluation components. Elements for expanding outreach were: (a) conduct media and public relations training, (b) produce and disseminate educational material on sulfur best management practices and reduced-risk weed management for newsletters and web sites, (c) disseminate educational materials at field events, and (d) conduct community outreach on sulfur best management practices and reduced-risk weed management strategies employed by local winegrape growers.

Numerous demonstration and outreach activities were conducted during year two. Nineteen field events and nine non-field events were conducted during which 390 growers and PCAs, 1158 vineyard foremen and workers, and 355 members of the general public were educated. Presentations for growers and PCAs included PMA and its objectives, specific reduced-risk strategies and tactics for managing sulfur and weeds, the integration of sulfur and weed management with sustainable whole farming systems, relevant laws and regulations, safe and successful farming at the urban interface, and field demonstrations of management practices and

results and equipment. Vineyard foremen and workers predominantly were trained on sulfur best management practices in Spanish and English languages. The general public was educated about the challenges faced by winegrape growers, that most growers care and act to minimize pesticide risks, and about the efforts by PMA. Many other agriculturists were exposed to PMA and its teachings via outside presentations, trade magazine and professional society articles, newsletter and web site publications, widespread distribution of handouts, and one-to-one communication.

Especially noteworthy achievements were the development and implementation of a worker training module on sulfur stewardship and safety, the establishment of the Napa County Spanish Viticulture Technical Group, and the establishment of the Napa Vineyard Open House Program.

PMA is envisioned as a multiple-year project, with significant achievements expected as a result of repetition and expansion of work over time. Nevertheless, impacts are becoming clear after two years. A survey of a majority of North Coast growers, for example, documents that most have been exposed to PMA and its teachings, and had or will change pest management practices as a result. The program underway for year three is being intensified and expanded to further educate growers and PCAs, foremen and workers, and the general public. The synergy resulting from educating these three groups should reduce real and perceived risks from pesticides and improve inter-group understandings and relationships.

By intensifying and expanding effort over time, PMA expects to achieve marked reductions in sulfur drift incidents and uses of higher-risk herbicides. The project is directly measuring reductions in risks by analyzing regional changes in reports of sulfur drift as well as fungicide and herbicide uses as annual pesticide use report data become available. The first effects of PMA on sulfur drift incidents and pesticide (e.g. high-risk herbicides) uses are expected for year 2001 data.

The continued execution of PMA will speed the adoption of reduced-risk pest management among California's 4,400 winegrape growers, protecting the public interest through minimizing human health and environmental risks and promoting sustainable practices in the \$1.89 billion winegrape industry.

BODY OF REPORT

Introduction

The California winegrape community currently is involved in a third year of its partnership with the California Department of Pesticide Regulation (DPR) for the California Winegrape Pest Management Alliance Project (PMA), a project to speed the adoption of reduced-risk pest management in California winegrapes. This report covers objectives, tasks, and activities for the second functional year, July 1, 2001 – June 30, 2002.

The US wine community has adopted a strategic vision to be leaders in sustainable practices (*American Vineyard*, March 2000b). On a statewide level, the California Association of Winegrape Growers (CAWG) has made a commitment to encourage growers to adopt sustainable vineyard practices. This is best exemplified by CAWG's leadership in ensuring the success of PMA (Browde, 2001a-c; *Vineyard & Winery Management*, 2001) and through a recent collaboration with the Wine Institute to begin developing a Code of Sustainable Winegrowing Practices for California. In future years, PMA is positioned to help implement elements of this Code.

Organizational Structure

The PMA Steering Committee was formed in August 1999 as a group of grower organizations and wineries committed to sustainable viticulture. It includes representatives from Allied Grape Growers, American Vineyard Foundation, Calaveras Wine Association, CAWG, California North Coast Grape Growers Association, Canandaigua Wine Company, Central Coast Vineyard Team, Clarksburg Wine Growers Association, Lodi-Woodbridge Winegrape Commission, Mendocino Winegrowers Alliance, Monterey County Grape Growers, Napa Valley Grape Growers, Robert Mondavi Winery, and Sonoma County Grape Growers Association. Technical Advisors include representatives from UC Cooperative Extension, UC Sustainable Agricultural Research and Education Program, USDA-ARS, and US EPA Region 9. A representative of DPR is directly associated with and an important contributor to the project. Collectively, the Steering Committee and Technical Advisors constitute the PMA Management Team (**Table 1**).

Individually, California's winegrape associations have shown leadership in educating growers about reduced-risk pest management. Such efforts include those by the Lodi-Woodbridge Winegrape Commission (Ohmart, 1998), the Central Coast Vineyard Team (Central Coast Vineyard Team, 1998), the Sonoma County Grape Growers Association (*American Vineyard*, 2000a), the Napa Sustainable Winegrowing Group (Napa Sustainable Winegrowing Group, 1997), and the Sonoma Valley Vintners and Growers Alliance (Wickerhauser et al., 1998). Importantly, PMA does not duplicate regional efforts but collaborates closely and effectively with regional organizations to complement and expand activities by providing the organizational framework and teamwork for resolving statewide problems through the efficient transfer of pest management information within and among regions.

CAWG provides the institutional structure for PMA. CAWG was founded in 1974 to represent the interests and concerns of wine and concentrate grape growers. Today, CAWG represents over 60% of California's winegrape growers. California ranks first in US winegrapes accounting

for over 90% of all production. The 2000 crop was valued at approximately \$1.89 billion (MKF Research, 2001). Winegrapes are grown in 42 of California's 58 counties on an estimated 458,000 bearing and 110,000 non-bearing acres (CAWG, 2001). There are over 4,400 winegrape growers and 847 wineries that contribute to making wine the number one finished agricultural product in California with an estimated overall economic impact of \$33 billion per year as a sum of total spending (MKF Research, 2001).

Objectives and Tasks

The goals of DPR's Alliance Program, to encourage the development and demonstration of economically sound pest management systems that reduce pesticide risks to human health and the environment, are directly aligned with the goals of the winegrape industry. The combination of regional and statewide winegrape leadership along with the overlap in respective goals is ideal for maintaining a strong and effective PMA partnership with DPR to expedite the adoption of reduced-risk pest management systems in California winegrapes.

The overarching goal of PMA is to promote and increase the adoption of reduced-risk pest management practices in winegrapes throughout California. To complement and expand regional efforts, the project focuses on the top two statewide problems involving pesticide risks and winegrape production – 1) sulfur drift and 2) uses of herbicides either classified as groundwater contaminants or FQPA (1996 Food Quality Protection Act) priority I (highest risk) materials.

For year two, the specific objective was to further develop and intensify a statewide program to demonstrate and expand outreach on sulfur best management practices and reduced-risk weed management strategies. The intent was to maintain the educational program for winegrape growers and pest control advisors (PCAs), while expanding outreach to the general public. Although not included in the original proposal, significant effort also was conducted for educating vineyard foremen and workers.

Sulfur drift onto sensitive areas is an important concern. Human exposure to sulfur can cause eye and skin irritation and breathing difficulty. Off-site deposition also can result in phytotoxicity to surrounding crops and contaminate surface water. As an active ingredient, sulfur is the most commonly used pesticide in California agriculture and is a key tool for managing powdery mildew – one of the major diseases affecting winegrapes throughout the world. Unfortunately, high profile reports of public complaints of sulfur drift have occurred in recent years. A majority of the reports during the interval 1997 to June 1999 cited grapes as the target source (**Figures 1 and 2**). Moreover, approximately 80% of the reports were attributed to dusting sulfur, extensively used due to its low cost and efficacy. Incidents included drift onto neighboring residences, schools, office buildings, moving vehicles, and workers in surrounding vehicles (Browde and Ohmart, 2001). A key factor for the increase in complaints is the increase in agricultural/urban interfaces. Despite sulfur being approved for organic farming, excessive drift complaints could lead to regulations that limit uses. Continued efforts in educating the winegrowing community and the general public should minimize pesticide drift incidents and help sustain the safe, effective uses of sulfur. Importantly, regulations leading to decreased uses of sulfur could increase uses of FQPA priority I fungicides (e.g. myclobutanil, triflumizole, triadimefon).

Figure 1. Sulfur Drift Incidents by Crop (1997-99)

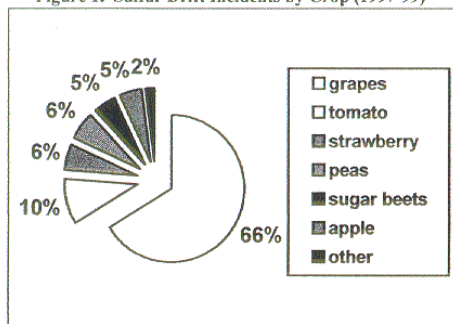
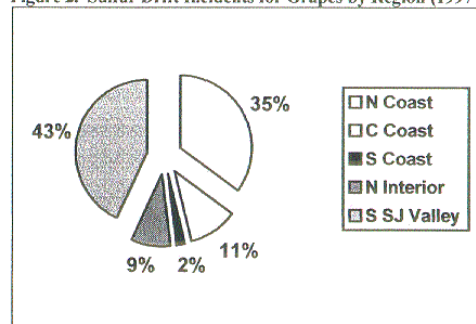


Figure 2. Sulfur Drift Incidents for Grapes by Region (1997-99)



There are statewide concerns about non-target effects of herbicides. Herbicides used in grape production have been detected in groundwater. Many herbicides registered for grapes also are considered higher-risk materials in terms of human health. FQPA implementation and future state regulations may restrict available herbicides and uses. This would be problematic since only one (Roundup, glyphosate) of the eight most commonly used herbicides on winegrapes (**Figure 3**) is considered a lower-risk material (Browde, 2001b-c). PMA is minimizing non-target risks and ensuring grower preparedness through widespread communication of viable means to reduce uses of herbicides associated with groundwater contamination, i.e. simazine, diuron, and norflurazon, or listed as FQPA priority I materials, e.g. oxyfluorfen, simazine, paraquat, and oryzalin (**Table 3**).

Figure 3. Herbicide Uses in Winegrapes (1998)

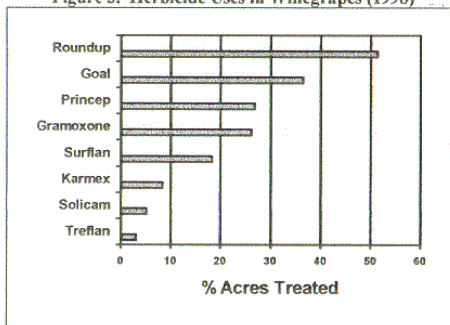


Table 3. Higher-risk Herbicides Registered for Grapes

Risk – water quality	Risk – FQPA I
• simazine (Princep)	• simazine (Princep)
• diuron (Karmex)	• oryzalin (Surflan)
• norflurazon (Solicam)	• oxyfluorfen (Goal)
	• paraquat (Gramoxone)
	• trifluralin (Treflan)
	• pedamethalin (Prowl)
	• 2,4-D (Envy)

To develop and execute a statewide educational program on reduced-risk practices for sulfur and weed management, the project had two key tasks for the second year: (1) demonstrate strategies and (2) expand outreach. Specific task elements used for achieving each task are listed in **Table 4**. The expected timeline for second-year activities is included in **Appendices**.

Table 4. Tasks, Task Elements, and Responsible Individuals/Groups.

Task 1: Demonstrate Strategies Task elements listed below	Responsible for Task and Elements
(a) Survey and compile updated information on region-specific sulfur best management practices and reduced-risk weed management	Project Coordinator with assistance from Management Team
(b) Update and refine educational material on sulfur best management practices and reduced-risk weed management	Project Coordinator with Management Team input and guidance
(c) Retain grower-cooperators from year one and recruit additional cooperators across the five major production regions to demonstrate sulfur best management practices and reduced-risk weed management	Project Coordinator working with Management Team and other regional leadership
(d) Implement reduced-risk options at demonstration vineyards	Grower-cooperators
(e) Organize and hold field events at demonstration sites in each region	Project Coordinator working with Management Team and grower-cooperators
(f) Document practices at demonstration vineyards, field event participation, and other evaluation components	Project Coordinator working with grower-cooperators

Table 4 continued. Tasks, Task Elements, and Responsible Individuals/Groups.

Task 2: Expand Outreach Task elements listed below	Responsible for Task and Elements
(a) Conduct two media and public relations training to improve outreach skills	Brown-Miller Communications working with Management Team and Project Coordinator
(b) Produce and disseminate educational material on sulfur best management practices and reduced-risk weed management for regional and statewide newsletters and web sites	Project Coordinator working with regional and CAWG personnel and contractors on newsletter copy and web site content
(c) Disseminate educational materials on sulfur best management practices and reduced-risk weed management at field events	Project Coordinator working with Management Team and grower-cooperators
(d) Conduct community outreach on sulfur best management practices and reduced-risk weed management employed by local winegrape growers	Regional leadership (Management Team and other regional personnel) working with Project Coordinator and grower-cooperators

It was expected that the execution of the objective and associated tasks and elements would lead to measurable results in terms of demonstrating reduced-risk pest management practices in all major California winegrape growing regions, documenting these practices and reductions in risk, tracking and analyzing statewide data for sulfur drift incidents and pesticide uses for powdery mildew and weeds, and communicating results to agricultural and non-agricultural communities through aggressive outreach.

The project objective is consistent with the overall project goal of further speeding the wide-scale adoption of sustainable vineyard practices including sulfur best management practices and reduced-risk weed management strategies in all winegrowing regions of the state.

Results

The following details project results by task and task element for year two.

Task 1: Demonstrate sulfur best management practices and reduced-risk weed management strategies.

(a) Survey and compile updated information on region-specific sulfur best management practices and reduced-risk weed management (original timeline - 1 July – 30 September 2001).

Much information has been collected over the course of two years and used as content for PMA educational materials. Although most year-two effort towards achieving this task element was done during the interval noted above, information acquisition and management is a continuous activity.

Updated information was sourced from discussions and field visits with grower-cooperators, other winegrape growers and organizations, PCAs, Management Team members, UC Cooperative Extension personnel, county agriculture commissioners, farm bureau personnel, winery personnel, university researchers, Sulfur Task Force members, and DPR personnel.

Information also has and continues to be obtained from pertinent literature such as the *Lodi Winegrower's Workbook* (Ohmart and Matthiasson, 2000); UC IPM Pest Management Guidelines; California Winegrape Crop/Pest Profile (1999); California Winegrape PMA Evaluation (Ross and Dlott, 2000); *Sulfur Best Application Practices Manual* (2000), and *Cover Cropping in Vineyards Handbook* (Ingels et al., 1998); and from resources relevant to managing diseases (Gubler et al., 1998; Gubler and Thomas, 1999; Stapleton et al., 1990) and weeds (Elmore et al., 1998a-b; Varela et al., 1995) and those characterizing the economics of winegrape production (Smith et al., 1999; Klonsky et al., 1998; Klonsky et al., 1997; Takele and Bianchi, 1996).

Data for sulfur drift incidents and pesticide uses continue to provide useful information on reduced-risk practices. Statewide historical records (1997- mid June 1999) for sulfur drift incidences have been summarized, quantified, and published (Browde 2001b-c; Browde and Ohmart, 2001). Drift incident data for the remainder of 1999 and 2000 were obtained and reviewed during year two. For herbicide and other pesticide uses, work continues with UC Davis, the California Department of Food and Agriculture, and UC Sustainable Agriculture Research and Education Program to determine statewide and regional pesticide use trends over time and identify model practitioners. This sulfur and herbicide information is used to characterize low-risk practices, position and intensify field demonstration activities, and help measure project success. The first effects of PMA on drift incidents and pesticide (e.g. high-risk herbicides) uses are expected for year 2001 data, which will be analyzed when made available.

Relevant information will continue to be collected throughout the duration of the project as new strategies and tactics evolve. The Project Coordinator and Management Team continue to obtain supplemental written and verbal information for managing sulfur and weeds.

(b) Update and refine educational material on sulfur best management practices and reduced-risk weed management (original timeline - 1 August – 31 October 2001).

Over the course of two years, teams composed of the Project Coordinator, Principal Investigator, winegrape growers, PCAs, and representatives of UC Cooperative Extension, UC Sustainable Agriculture Research and Education Program, EPA, and DPR produced an assortment of educational material pertaining to best management practices for sulfur and reduced-risk weed management. Many handouts have been prepared and distributed to growers, PCAs, vineyard foremen and workers, and the general public at field and other outreach events. Materials also include articles published in trade magazines, newsletters, and on web sites.

Written material continues to be updated and refined to account for new practices and understandings, to supplement existing information, and to ensure highest quality. Materials produced during year two are listed in **Table 5** and many are included in **Appendices**. Materials produced during the first year are not included here but can be found in the final report for year one (Browde, 2001d).

Table 5. Educational/Outreach Materials prepared during Year Two.

<u>Release</u>	<u>Where</u>	<u>When</u>
PMA Overview – Eng & Span	handouts library	numerous
Pract Neigh & Com Relations	handouts library	numerous
Neighbor Outreach – It’s Your Responsibility	handouts library	numerous
Guidelines for Pub Educ Events	handouts library	numerous
Powdery Mildew Resistance Mgt And Disease Index	handouts library	numerous
Best Mgt Practices for Sulfur in Winegrapes – Eng & Span	handouts library	numerous
Sulfur Dust Stewardship & Safety Instructor’s Guide – Eng & Span	Train-the-Trainers (Lodi & Napa)	Jan-Feb 2002
CCVT Focus on Sulfur	Wines & Vines Magazine	Oct 2001
CA Winegrape Pest Mgt Alliance	Proc CA Weed Sci Soc	2002
Herbicides Added to CAWG Prgm	Western Farm Press	Feb 2002
Catching the Drift	California Farmer	June 2002
Winegrape PMA Field Day Goes Deep	Grape Grower Magazine	June 2002
Winegrape PMA – An Update	power point presentation	numerous
PMA & Sulfur – Eng & Span	power point presentation	numerous
Integrating Mildew Model & Resist Mgt – Eng & Span	power point presentation	CSU-Fres Apr 2002
PMA & Weeds	power point presentation	numerous
Judicious Weed Mgt w/Herbicides -Eng & Span	power point presentation	numerous
Balancing Costs & Risks in Weed Mgt	power point presentation	CSU-Fres Apr 2002
Weed Control Alternatives	power point presentation	S Rosa Apr 2002
10+ newsletter articles	regional/statewide ag newsletters	July 2001 – Jun 2002
9+ web site articles	regional/statewide ag web sites	July 2001 – Jun 2002
1 newspaper article	The Tribune “Wine Notes”	June 21, 2002

Winegrape growers, PCAs, and vineyard foremen and workers are applying information from these educational materials to progress towards lower-risk, more sustainable pest management systems. For example, the handout (English and Spanish) *Best Management Practices for Sulfur in Winegrapes* provides information that characterizes environments sensitive to sulfur and

details 10 key elements to especially consider for managing sulfur near sensitive surroundings. Growers and PCAs use this information to develop sulfur management plans specific for their vineyards and for implementing plans with foremen and workers.

Although PMA focuses on sulfur and weed management, the educational information (written and oral) advocates uses of biologically based, lower-risk approaches for managing all winegrape pests.

(c) Retain grower-cooperators from year one and recruit additional cooperators across the five major production regions to demonstrate sulfur best management practices and reduced-risk weed management (original timeline - 1 October – 30 November 2001).

Thirty six grower-cooperators (**Table 2**) have been recruited over two years across five winegrowing regions – North Coast (8), Central Coast (5), South Coast (2), Northern Interior (9), and South Central Valley (12). Cooperators implement various strategies and tactics for sustainable sulfur application and reduced-risk weed management based on circumstances specific for their regions and individual vineyards. Importantly, cooperators demonstrate and/or describe lower-risk practices at field events and meetings. Demonstration efforts across the state cover a wide variety of challenges and reduced-risk alternatives for managing sulfur and weeds.

Results from analyses of pesticide use report data and sulfur drift incidents will continue to be used to target and recruit cooperators for positioning additional demonstration vineyards throughout the duration of the project.

(d) Implement reduced-risk options at demonstration vineyards (original timeline - begin November 2001).

For year two, the implementation of reduced-risk strategies and tactics for managing weeds began during November 2001. The implementation of options for sustainable sulfur application began during March 2002.

(e) Organize and hold field events at demonstration sites in each region (original timeline - begin January 2002).

A total of 19 PMA field events were conducted in English or Spanish languages during year two – five for winegrowers and PCAs, two for vineyard foremen and workers, and 12 for the general public (**Table 6**).

Additionally, nine PMA non-field events in English and/or Spanish languages were held during year two – one for winegrowers and PCAs, seven for vineyard foremen and workers, and one for the general public (**Table 7**). Despite no live demonstrations, these events included use of field simulations and photographs as a means to demonstrate sulfur and weed management and other reduced-risk practices.

PMA field and non-field events focused on or included elements of sulfur best management practices and/or reduced-risk weed management, along with demonstrations and instruction on

principles and other specifics of reduced-risk pest management and sustainable viticulture. Agendas or announcements for many of these events are included in **Appendices**.

Table 6. PMA Field Events (Field Days and Workshops); NC=North Coast, CC=Central Coast, NI=Northern Interior, SSJ=South Central Valley.

Target audience = winegrowers and PCAs

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
4/24/02	Santa Rosa (NC)	Sulfur & Weeds	120
4/26/02	Fresno (SSJ)	Sulfur & Weeds	110
4/30/02	Lockeford (NI)	Sulfur	40
5/15/02	Lodi (NI)	Weeds	60
5/29/02	Hopland (NC)	Sulfur & Weeds	<u>33</u>
			363 total

Target audience = vineyard foremen and workers

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
8/17/01	S Barbara Co (CC)	PMA/CCVT (Span)	25
4/24/02	Santa Rosa (NC)	Sulfur & Weeds (Span)	<u>9</u>
			34 total

Target audience = general public

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
11/29/01	Napa (NC; local officials)	Community relations	35
4/27/02	Napa (NC) – 10 vineyards	Gen Vit & RR pest mgt	300
5/11/02	Lockeford (NI)	Gen Vit & RR pest mgt	<u>15</u>
			350 total

Table 7. PMA Non-field Events (Meetings and Workshops); NC=North Coast, CC=Central Coast, NI=Northern Interior, SSJ=South Central Valley.*Target audience = winegrowers and PCAs*

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
4/17/02	Madera (SSJ)	Sulfur	27

Target audience = vineyard foremen and workers

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
1/25/02	Lodi (NI; train-the-trainers)	Sulfur (Span & Eng)	68
1/31/02	Sacramento (statewide)	PMA & sulfur (Span)	40
3/1/02	Lodi (NI; farm safety day)	Sulfur (Span & Eng)	470
3/12/02	Los Alamos (CC)	Sulfur (Span)	98
3/12/02	Paso Robles (CC)	Sulfur (Span)	25
3/13/02	Greenfield (CC)	Sulfur (Span)	23
3/27/02	Napa (NC; worker training)	Sulfur (Span & Eng)	<u>400</u>
			1124 total

Target audience = general public

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
4/4/01	Lockeford/Clements (NI)	Gen Vit & RR pest mgt	5

(f) Document reduced-risk practices at demonstration vineyards, field event participation, and other evaluation components (original timeline - begin November 2001).

The project coordinator continues to acquire cooperator records of reduced-risk practices for sulfur and weed management. The timely acquisition of these data has been more challenging than anticipated. Records have and will continue to be used for characterizing various low-risk strategies and tactics, including economic considerations, and communicating results to growers, PCAs, and vineyard foremen and workers.

Participation at PMA field and non-field events during year two is detailed in **Tables 6 and 7**, respectively. Through these events, PMA educated an estimated 390 winegrape growers and PCAs, 1158 vineyard foremen and workers, and 355 members of the general public. Numerous other growers, PCAs, and vineyard foremen and workers were alerted to PMA and its teachings as a result of 13 outside presentations (**Table 8**).

After two years, some impacts of PMA are clear. Surveys have been used for early measurements of changes in grower and PCA behavior. A survey of North Coast growers quantified exposure to and effects of PMA after its first year (see **Appendices**). Respondents owned or managed 55% of the winegrape acreage in a four county area – Napa, Sonoma, Mendocino, and Lake. Results were encouraging with a majority of respondents having already been exposed to PMA and its teachings about reduced-risk weed management, sulfur drift

management, IPM, sustainable vineyard practices, and community and neighbor concerns. Moreover, many respondents indicated that they already had or will change pest management practices as a result of PMA. Surveys also were distributed to attendees at several field events during year two (see **Appendices**), for which results will be tabulated, analyzed, and interpreted to measure progress and improve future events.

Table 8. Outside Presentations about PMA and Reduced-risk Practices; NC=North Coast, CC=Central Coast, NI=Northern Interior, SSJ=South Central Valley.

<u>Date</u>	<u>Event (region)</u>	<u>Topic(s)</u>
7/12/01	Contra Costa County Growers Meeting (CC)	PMA overview & sulfur
11/7/01	Grape Grower Trade Show North (NI)	PMA overview & update
11/28/01	Ag Bus Com – Lodi Chamber of Commerce (NI)	Sulfur
1/15/02	CA Weed Sci Soc (statewide)	PMA & weeds
1/16/02	Dollars & Sense Wkshop (NC)	PMA poster
1/25/02	Napa Co Farm Bureau & Ag Com Meeting (NC)	Sulfur
1/29/02	CAWG Annual Meeting (statewide)	PMA poster
2/11/02	Napa Sust Winegrowing Group (NC)	PMA update
2/19/02	Madera Co Farm Bureau Meeting w/ED (SSJ)	PMA overview
3/12/02	PMA Projects Wkshop (statewide)	PMA update & poster
3/20/02	CAFF Wkshop (NC)	PMA & sulfur (Span)
5/2/02	Napa Co Span Vit Tech Group Meeting (NC)	Mildew & Sulfur (Span)
5/16/02	Sonoma Co Vit Tech Group Meeting (NC)	PMA update & weeds

The first effects of PMA on sulfur drift incidents and pesticide (e.g. high-risk herbicides) uses are expected for year 2001 data. These data will be analyzed and summarized when made available. Work continues with UC Davis, UC Sustainable Agriculture Research and Education Program, and the California Department of Food and Agriculture for determining statewide and regional pesticide use trends over time. Drift incidents for 2001+ will be requested from DPR.

Task 2: Expand outreach on sulfur best management practices and reduced-risk weed management strategies.

(a) Conduct two media and public relations trainings to improve outreach skills (original timeline – December 2001 and April 2002).

Only one training session to improve outreach skills was completed during year two. Brown-Miller Communications conducted a training session (March 28, 2002) on “Tailoring Communications to Specific Audiences”. Thirty four grower-cooperators, PCAs, winemakers, and directors of grower and vintner organizations attended. The content and timing of appropriate media and public relations training is being considered for year three.

(b) Produce and disseminate educational material on sulfur best management practices and reduced-risk management strategies for regional and statewide newsletters and web sites (original timeline – continuous).

Various written material has and will continue to be prepared for the winegrowing community (in English and Spanish) to enhance understandings and adoption of reduced-risk practices and to improve their relationships with the general public. During year two, expanded outreach was achieved through production of 10+ articles for newsletters, 9+ articles for web sites, and five articles for trade magazines and professional society proceedings (**Table 5**).

(c) Disseminate educational materials on sulfur best management practices and reduced-risk weed management at field events (original timeline – begin January 2002).

Updated, refined, and new educational materials (in English and Spanish) produced during the first two years were distributed at all PMA field and non-field events.

(d) Conduct community outreach on sulfur best management practices and reduced-risk weed management employed by local winegrape growers (original timeline – continuous).

Much general outreach to agricultural and non-agricultural communities on the project, reduced-risk practices, and means to improve neighbor/community relations was conducted during year two. Activities included 13 outside presentations to the agricultural community (**Table 8**) and one newspaper article for the general public (**Table 5**). Moreover, PMA handouts and other educational material were distributed at all meetings where PMA presentations were made and at other grower, vintner, and public events.

Discussion

The specific goal of PMA is to develop and execute a statewide program to demonstrate and expand outreach on sulfur best management practices and reduced-risk weed management. During its first year, significant progress was made in designing and implementing a successful program for winegrape growers and PCAs, and in starting a limited public educational program (Browde, 2001d).

The planned effort for year two was to maintain the educational program for growers and PCAs, while expanding outreach to the general public. As the year progressed, the Management Team decided to simultaneously educate vineyard foremen and workers and began a coexisting program, although not included in the original proposal.

The field and non-field events conducted during year two resulted in the education of significant numbers of each target audience. An estimated 390 growers and PCAs were educated through six PMA led or co-led events. Although the number of and attendance at grower and PCA events were less than those for year one, two events each were conducted in three major winegrowing regions – North Coast, Northern Interior, and South Central Valley. Events included participation and presentations by growers, PCAs, extensionists, researchers, and county regulators. Topics included presentations on PMA and its objectives, specific reduced-risk strategies and tactics for managing sulfur and weeds, the integration of sulfur and weed management with sustainable whole farming systems, relevant laws and regulations, safe and

successful farming at the urban interface, and field demonstrations of management practices and results and equipment.

The number of vineyard foremen and workers educated was remarkable. Through nine events conducted in the Central Coast, North Coast, and Northern Interior regions, 1158 foremen and workers were alerted to PMA and trained on sulfur best management practices in Spanish and English languages. Two especially noteworthy achievements were the incorporation of sulfur stewardship and safety into the “Train-The-Trainers” program and the establishment of the Napa County Spanish Viticulture Technical Group. PMA’s *Sulfur Dust Stewardship and Safety Instructor’s Guide* (in Spanish and English) was used to train large numbers of workers in safe, sustainable sulfur application and handling at the Napa County Hands-On Training for Pesticide Applicators and at the Lodi Farm Safety Day. PMA led the establishment of the Napa County Spanish Viticulture Technical Group, for which the first seminar was a PMA presentation on powdery mildew biology and management (including sulfur).

It is important to note that numerous other growers, PCAs, and vineyard foremen and workers have been exposed to PMA and its teachings on reduced-risk pest management via outside presentations, trade magazine and professional society articles, newsletter and web site publications, widespread distribution of handouts, and one-to-one communication.

According to plan, effort was expanded in public education. A total of 13 vineyard open houses, field tours, and meetings were held to educate the public about the challenges faced by winegrowers, that most growers care and act to minimize pesticide risks, and the efforts by PMA. Through this expanded year-two program, approximately 355 members of the general public were enlightened.

PMA activities during year two were successful and a result of effective collaborations (i.e., partnerships) among individuals and groups from different backgrounds and interests working towards the common goals of increasing the adoption of reduced-risk pest management and improving relations between agricultural and non-agricultural communities. Key collaborations that continue to contribute to PMA’s success are the buy-in and assistance from major wineries across the state (e.g., Bronco, Canandaigua, Domaine Chandon, E & J Gallo, Fetzer, Kendall-Jackson, and Robert Mondavi), the cooperation and information sharing across winegrowing regions and grower organizations, and the combined effort by PMA, the Sulfur Task Force, county agriculture commissioners, UC Cooperative Extension, and DPR in reducing sulfur drift incidents through jointly prepared and shared presentations and compositions.

PMA is envisioned as a multiple-year project, with significant achievements expected as a result of repetition and expansion of work over time. Nevertheless, impacts are becoming clear after two years. Attendance at field and non-field events generally has been excellent. An initial review of questionnaire results from year-two field events for growers and PCAs show that attendees continue to enjoy the presentations and demonstrations and find them useful. A survey of North Coast growers documents that most have been exposed to PMA and its teachings, and had or will change pest management practices as a result.

By intensifying and expanding effort over time, PMA expects to achieve marked reductions in incidents of sulfur drift and uses of higher-risk herbicides. The project is directly measuring reductions in risks by analyzing regional changes in reports of sulfur drift as well as fungicide and herbicide uses on California winegrapes as annual pesticide use report data become available. The first effects of PMA on sulfur drift incidents and pesticide (e.g. high-risk herbicides) uses are expected for year 2001 data. These data will be analyzed and summarized when made available. Work continues to determine statewide and regional pesticide use trends over time. Drift incidents for 2001+ will be requested from DPR.

The program underway for year three will be intensified and expanded to further educate three key groups – growers and PCAs, foremen and workers, and the general public. Collectively, these groups directly or indirectly influence vineyard activities. Unfortunately, most educational programs promoting reduced-risk agriculture target only those English speakers directly involved in production. The synergy resulting from educating the three groups described here should greatly reduce real and perceived risks associated with pesticides and improve inter-group understandings and relationships.

Summary and Conclusions

PMA is envisioned as a multiple-year project, with significant progress anticipated as a result of repetition and expansion of effort. Key objectives over the first three years are detailed below.

Year one (June 15, 2000 – June 30, 2001)

- Begin significant grower and PCA education for reduced-risk pest management (key targets = sulfur and weeds)
- Begin activities in public education (general target = growers care and act, e.g. PMA)

Year two (July 1, 2001 – June 30, 2002)

- Continue grower and PCA education for reduced-risk pest management (key targets = sulfur and weeds)
- Expand activities in public education (general target = growers care and act; e.g. PMA)
- Begin activities in foremen and worker education (key targets = sulfur and weeds)

Year three (July 1, 2002 – June 30, 2003) - ONGOING

- Continue grower and PCA education for reduced-risk pest management (key targets = sulfur and weeds)
- Continue activities in public education (general target = growers care and act; e.g. PMA)
- Expand activities in foremen and worker education (key targets = sulfur and weeds)
- Begin transitioning PMA to help implement Code for Sustainable Winegrowing Practices

In summary, PMA had a successful second year. Significant accomplishments were:

- 1) Continued buy-in and assistance from grower organizations and major wineries, e.g., Bronco, Canandaigua, Domaine Chandon, E & J Gallo, Fetzer, Kendall-Jackson, and Robert Mondavi
- 2) Continued partnerships with DPR, EPA, USDA, UC Cooperative Extension, UC Sustainable Agriculture and Education Program, Sulfur Task Force, agriculture commissioner's offices, county farm bureaus, growers and grower organizations, PCAs, and wineries
- 3) 36 grower-cooperators retained or recruited (target was 30) - North Coast (8), Central Coast (5), South Coast (2), Northern Interior (9), South Central Valley (12) – **Table 2**
- 4) 19 field events – 5 for growers and PCAs totaling 363 attendees, 2 for foremen and workers totaling 34 attendees, and 12 for the general public totaling 350 attendees (total field event target was 10) – **Table 6**
- 5) 9 non-field events – 1 for growers and PCAs totaling 27 attendees, 7 for foremen and workers totaling 1124 attendees, and 1 for the general public totaling 5 attendees – **Table 7**
- 6) 13 outside presentations made to agricultural community – **Table 8**
- 7) 5 articles in trade magazines and professional society proceedings – **Table 5**
- 8) 10+ newsletter and 9+ web site publications – **Table 5**
- 9) 7 handouts/instructor guides, 7 powerpoint presentations, and 1 newspaper article – **Table 5**

The activities conducted by PMA have advanced concepts and application of reduced-risk pest management for winegrapes across the state by complementing and expanding regional integrated pest management and integrated farming programs and by providing crucial inter-regional sharing of information. The purpose is to promote sensible practices that limit environmental and human health risks from pesticides, keep growers in business (i.e., minimize economic risk), and foster positive human interaction. Efforts are expected to have marked impacts on reducing incidents of sulfur drift, reducing uses of higher-risk herbicides and other pesticides, and improving understandings and relationships between the agricultural community and the general public.

REFERENCES

- American Vineyard. 2000a. State Awards Grant for Vineyard Pest Management Study. p. 17, American Vineyard, March 2000.
- American Vineyard. 2000b. Wine Vision Consensus on Strategic Plan. p. 21, American Vineyard, March 2000.
- Browde, J. 2001a. Taking Charge. Pp. 26H-26I, Western Fruit Grower, February 2001.
- Browde, J. 2001b. The Winegrape Pest Management Alliance. Pp. 8-9, 19-20, CAPCA Adviser, May/June 2001.
- Browde, J. 2001c. Winegrowers Help Themselves Through Statewide Effort. Pp. 23-25, California North Coast Vineyard News, Summer 2001.
- Browde, J. 2001d. Pest Management Alliance Project Final Report, Agreement Number 99-0257.
- Browde, J. and C. Ohmart. 2001. Improving Sulfur Management. pp. 11-12., Practical Winery & Vineyard, May/June 2001.
- California Farmer. 2000. IPM Innovators. p. 8, California Farmer, Mid-March 2000.
- California Winegrape Crop/Pest Profile. 1999. California Grape Advisory Team. FQPA Grape Partnership.
- Central Coast Vineyard Team. 1998. Central Coast Vineyard Team Positive Points System. Practical Winery and Vineyard, May/June pages 12-24.
- Elmore, C., H.S. Agamalian, D. Donaldson, and B.B. Fischer. 1998a. Weeds. *In* M.L. Flint (ed.) UC IPM Pest Management Guidelines: Grape. University of California Division of Agriculture and Natural Resources.
- Elmore, C.L., D.R. Donaldson, and R.J. Smith. 1998b. Effects of cover cropping on pest management: Weed management. *In* C. Ingels, P. Christensen and G. McGourty (eds.), Cover Cropping in Vineyards: A Growers Handbook, pp. 93-106. University of California Division of Agriculture and Natural Resources Publication 3338.
- Gubler, D., J. Stapleton, G. Leavitt, A. Purcell, L. Varela, and R.J. Smith. 1998. Diseases. *In* M.L. Flint (ed.) UC IPM Pest Management Guidelines: Grape. University of California Division of Agriculture and Natural Resources.
- Gubler W. D. and C.S. Thomas. 1999. Implementation of a regional disease warning system: a university perspective. *Phytopathology*.
- Ingels, C. A., R. L. Bugg, G. T. McGourty, and P. Christensen (eds.). 1998. Cover Cropping in Vineyards: A Grower's Handbook. University of California, Division of Agriculture and Natural Resources Publication 3338.
- Klonsky, K., Elkins, R., and P. Livingston, 1998. Sample Costs to Establish a Vineyard and Produce Wine Grapes: Sauvignon Blanc in Lake County. 1998 Sauvignon Blanc Cost and Return Study, Lake County. University of California.
- Klonsky, K., B. Beede, P. Christensen, M. Costello, N. Dokoozlian, G. Leavitt, D. Luvisi, M. Norton, B. Peacock, and P. Livingston. 1997. Sample Costs to Establish a Vineyard and Produce Wine Grapes: San Joaquin Valley, 1997. University of California.
- Napa Sustainable Winegrowing Group. 1997. Integrated Pest Management. Field Handbook for Napa County. First Edition.
- Ohmart, C. P. 1998. Lodi-Woodbridge Winegrape Commission's Biologically Integrated Farming System for Wine Grapes. Final Report.
- Ohmart, C. P. and S. K. Matthiasson. 2000. Lodi Winegrower's Workbook: A Self-Assessment of Integrated Farming Practices. Lodi-Woodbridge Winegrape Commission, Lodi, CA.

- Ross, K. and J. Dlott. 2000. California Winegrape Pest Management Alliance Evaluation.
- Smith, R., K. Klonsky, and P. Livingston, 1999. Sample Costs to Establish a Vineyard and Produce Wine Grapes: Chardonnay in Sonoma County. 1999 Chardonnay Cost and Return Study, Sonoma County. University of California.
- Stapleton, J. J., W. W. Barnett, J. J. Marois, and W. D. Gubler. 1990. Leaf removal for pest management in wine grapes. Calif. Agric. 44(5): 15-17.
- Sulfur Best Application Practices Manual. 2000. Coalition for Urban/Rural Environmental Stewardship.
- Takele, T. and M. Bianchi. 1996. Sample Costs to Establish a Vineyard and Produce Wine Grapes: Drip Irrigated Chardonnay in Santa Mara Valley. University of California.
- Varela, L., C. Elmore, K. Klonsky, and W.A. Williams. 1995. Cultural management of vine row weeds in North Coast vineyards. Davis: University of California Statewide IPM Project 1995 Final Report.
- Vineyard & Winery Management. 2001. Are You a Good Neighbor? P. 6, Vineyard & Winery Management, May/June 2001.
- Wickerhauser, O., R. Smith, and L. Varela. 1998. Sonoma Valley Vintners & Growers Alliance and University of California Cooperative Extension. Development of Integrated Pest Management Approaches for Wine Grape Growing areas of Sonoma Valley.

APPENDICES

Timetable – Timeline for second year tasks (July 1, 2001 to June 30, 2002). Light gray marks the starting point and black the completion dates (if discrete item) for each task element**

Task 1: Demonstrate Strategies Task Elements Listed Below	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
(a) Survey and compile updated information on region-specific sulfur best management practices and reduced-risk weed management																
(b) Update and refine educational material on sulfur and weeds																
(c) Retain grower-cooperators from year one and recruit additional cooperators across the five major production regions (30+ total cooperators) to demonstrate reduced-risk practices																
(d) Implement reduced-risk options at demonstration vineyards																
(e) Organize and hold two field events per year at demonstration sites in each of the five regions																
(f) Document vineyard practices at 30+ sites, field event participation, and other evaluations of project progress																
Task 2: Expand Outreach Task Elements Listed Below																
(a) Conduct two media and public relations trainings to improve outreach skills																
(b) Produce and disseminate educational material on sulfur best management practices and reduced-risk weed management for regional and statewide newsletters and web sites																
(c) Disseminate educational materials on sulfur best management and reduced-risk weed management at field events																
(d) Conduct community outreach on sulfur best management practices and reduced-risk weed management strategies employed by local winegrape growers																

WINEGRAPE PEST MANAGEMENT ALLIANCE – FOCUS & TIMELINE

Focus

To review, PMA is a statewide grower-driven effort to minimize pesticide risks in winegrape production and to improve understandings and relationships between the agricultural community and the general public. Our purpose is to promote sensible practices that limit environmental and human health risks from pesticides, keep growers in business (i.e., minimize grower economic risk), and foster positive human interaction. Two areas of focus continue to be best management practices for sulfur and reduced-risk weed management, although we emphasize how management tactics for sulfur and weeds relate to and fit into a whole-systems, integrated farming approach.

Timeline x Objectives

July 2000 – June 2001 (Year 1):	Begin Eng-speaking grower/PCA education (focus sulfur & weed mgt) Begin public education (model = PMA & regional actions)
July 2001 – June 2002 (Year 2): *ongoing	Continue Eng-speaking grower/PCA education (focus sulfur & weed mgt) Expand public education (model = PMA & regional actions) Begin foremen/worker education (focus sulfur & weed mgt in Spanish)
July 2002 – June 2003 (Year 3): *DPR funded @80% requested *EPA grant received	Continue Eng-speaking grower/PCA education (focus sulfur & weed mgt) Continue public education (model = PMA & regional actions) Expand foremen/worker education (focus sulfur & weed mgt in Spanish)

Pest Management Alliance Field Day April 24

California Winegrape PMA Project

Sponsored by California Association of Winegrape Growers
Sonoma County Grape Growers Association
& Russian River Valley Winegrowers

8:00 Registration - Kendall-Jackson Wine Center, Fulton

8:30 Welcome Nick Frey SCGGA & Joe Browde CAWG

8:45 Program

- Current Regulations and Problem Areas for Sonoma County, Lisa Correia, Sonoma County Deputy Agricultural Commissioner
- Weed Control Alternatives and Costs, Katey Taylor, Domaine Chandon
- Minimizing Sprayer Drift, Lars Sorensen, Hardi -US

10:30 Field Demonstration for vineyard owners & managers and Spanish-language vineyard supervisors and equipment operators

12:00 BBQ Lunch \$10 or Bottle of wine + \$5 prepared by RRVW

1:00 - 2:30 Spanish-language Workshop

- Q&A on Equipment Demonstrations
- Sulfur dusting Best Management Practices, Daniel Robledo
- Judicious Weed Management with Herbicides, Jon Kanagy, Nord Coast Vineyard Services

For reservations contact SCGGA at (707) 206-0603 or e-mail: ipm@scgga.org

Meeting Schedule for Integrated Pest Management Grower Appellation Meetings

HOST LOCATION	Russian River Jeff Lyon Laguna Ranch 2043 Laguna	Sonoma Valley Joe Votek Rancho Salina 17505 Mallard	Dry Creek John Clendenen Adams Vineyard 755 Canyon Rd.	Alexander Valley Keith Horn Reedy Ranch 2655 Hwy 128
I - Focus: Powdery Mildew, Phomopsis & Shoot Blight	April 8 9:00-10:30 a.m.	April 9 9:00-10:30a.m.	April 10 8:00-9:30 a.m.	April 10 10:30-12:00 p.m.
II - Focus: Willamette Mites & Powdery Mildew	May 13 9:00-10:30 a.m.	May 14 9:00-10:30a.m.	May 15 8:00-9:30 a.m.	May 15 10:30-12:00 p.m.
III - Focus: Grape Leafhoppers, Scale & Mealy Bugs	June 10 9:00-10:30a.m.	June 11 9:00-10:30a.m.	June 12 8:00-9:30 a.m.	June 12 10:30-12:00 p.m.
IV - Focus: Botrytis & Pacific Mites	July 8 9:00-10:30a.m.	July 9 9:00-10:30a.m.	July 10 8:00-9:30 a.m.	July 10 10:30-12:00 p.m.

There is no charge for any IPM session and meetings are open to all Sonoma County growers.

Discussion topics subject to change.

WINEGRAPE PEST MANAGEMENT ALLIANCE SEMINAR AND FIELD DAY

AGENDA

FRIDAY, APRIL 26, 2002

California State University, Fresno Satellite Student Union and Fresno State Vineyards

Presented by

*California Association of Winegrape Growers
Allied Grape Growers, E & J Gallo Winery, Canandaigua Wine Company,
Fresno State Viticulture and Enology Research Center and Department of Viticulture of Enology*

8:00 am Registration & Vendor Table Displays – Satellite Student Union

8:30 am Welcome and Description of Logistics
Joe Browde, Winegrape Pest Management Alliance
Robert Wample, California State University, Fresno

9:00 am Winegrape Pest Management Alliance and Sulfur Stewardship
Joe Browde, PMA Project Coordinator

9:20 am Integrating the Powdery Mildew Model and Resistance Management
George Leavitt, UCCE, Madera County

9:50 am Farming at the Urban Edge – Regulations, Decision Making, and Neighbor Relations
Doug Edwards, Deputy Agriculture Commissioner, Fresno County

10:20 am Break & Refreshments

10:30 am Balancing Costs and Risks in Weed Management
Kurt Hembree, UCCE, Fresno County

11:00 am Application of Reduced-risk Pest Management – A Practitioner's View
Jon Holmquist, Canandaigua Wine Company

11:30 am The Sustainable Winegrowing Project – A Self Assessment of Practices
Cliff Ohmart, Research and IPM Director Lodi-Woodbridge Winegrape Commission

12:00 noon Lunch - VE Building - Lawn
provided by E & J Gallo

1:30 pm Equipment Demonstrations and Discussions -
Fresno State Vineyards

3:30 pm End

5.5 Continuing Education Hours

PMA funding provided by the California Department of Pesticide Regulation and The California Association of Winegrape Growers

Please be sure to turn in your evaluation form and continuing education forms when you leave!
Thank you for coming!

Pest Management Alliance Field Day

Wednesday, May 29th

Brutocao Plaza, Hopland

Sponsored by
*California North Coast Grape Growers Association, Brutocao Plaza,
and the Crushed Grape Restaurant*

- 8:00 am **Registration & Coffee**
- 8:30 am **Update – Winegrape Pest Management Alliance (PMA)**
Joe Browde, Project Coordinator
- 8:50 am **Farming at the Urban Edge – Regulations, Decision Making, and
Neighbor Relations**
Tony Linegar, Mendocino County Deputy Ag Commissioner
Steve Hijack, Lake County Ag Commissioner
- 9:30 am **Powdery Mildew – Mildew Index and Resistance Management**
Glenn McGourty, UCCE Mendocino and Lake Counties
- 10:00 am **Break & Refreshments**
- 10:15 am **Reduced-Risk Pest/Weed Management, Grower Experiences**
Ulysses Lolonis, Lolonis Vineyards
Mark Pasternak, Devils Gulch Ranch
- 10:45 am **Good Neighbor Relations – Practical Experience**
Julie Nord, Nord Coast Vineyard Service
- 11:00 am **Equipment Demonstrations – low-drift sprayers & weed
management tools**
- 12:30 pm **Lunch - \$15**

Continuing Educations Hours for Pesticide Applicators Pending

PMA funding provided by the California Department of Pesticide Regulation and
The California Association of Winegrape Growers

North Coast 2001 PMA Survey Results

Exposed to the following topics:

	Heard of	Read articles	Discussed	Changed practices
Winegrape Pest Management Alliance				
Napa	55%	40%	18%	
Sonoma	49%	39%	21%	
Mendocino	71%	57%	32%	
Lake	50%	29%	21%	
Reduced-risk weed management				
Napa	61%	47%	39%	35%
Sonoma	59%	45%	37%	32%
Mendocino	60%	57%	35%	43%
Lake	36%	43%	21%	21%
Sulfur drift management				
Napa	76%	67%	55%	40%
Sonoma	80%	68%	56%	43%
Mendocino	94%	76%	75%	56%
Lake	79%	71%	57%	50%
Integrated pest management (IPM)				
Napa	78%	73%	58%	53%
Sonoma	83%	79%	64%	56%
Mendocino	90%	89%	71%	60%
Lake	50%	64%	43%	36%
Sustainable vineyard practices				
Napa	82%	81%	63%	55%
Sonoma	82%	76%	62%	56%
Mendocino	90%	89%	75%	63%
Lake	57%	43%	36%	50%
Community and neighbor relations				
Napa	79%	71%	60%	47%
Sonoma	86%	78%	69%	53%
Mendocino	86%	73%	75%	56%
Lake	86%	71%	64%	50%

Changed specified practices as a result of exposure to topics above:

	Reduced totl herbicide use	Substituted lower- for higher-risk	Increased worker training	Improved herbicide applic equip	Improved neighbor outreach	Improved sulfur dusting equip
Napa	61%	40%	46%	36%	54%	37%
Sonoma	69%	67%	47%	54%	72%	56%
Mendocino	60%	63%	48%	40%	63%	58%
Lake	36%	64%	64%	27%	73%	36%

PMA * Brutocao Seminar & Field Day 2002

Survey & Evaluation

How did you hear about this event? Flyer Newsletter Other: _____

Describe your connection with winegrapes:

Owner Manager PCA Winery Other: _____

How many acres do you own or farm?

1-25 26-50 51-100 100-500 500+

In what county (counties) do you grow winegrapes? _____

Have you ever received a citation or complaint about Sulfur Dust Drift? Yes No

How would you describe your weed control program? Circle all that apply.

Pre-emergent Post-emergent Mechanical Non-chemical Organic

Overall rating of today's speakers: Excellent Good Average Poor

Overall rating of location & facilities: Excellent Good Average Poor

Did you attend a Pest Mgt Alliance event last year? Yes No Where _____

If yes, indicate where:

Would you attend a similar event next year? Yes No

Should a Spanish program be held here next year? Yes No

Is this a convenient time of year to attend this event? Yes No Month _____

If not, please indicate when:

What did you enjoy most about today's event?

Speakers Field Demos Discussions Handouts

Comments or Suggestions to improve future Pest Management Alliance events:

Would you be interested in volunteering as a Grower Cooperator for the Pest Management Alliance?

If yes, please fill out contact information.

Name: _____ Affiliation: _____

Phone: _____ E-mail: _____

FOR IMMEDIATE RELEASE

March 22, 2002

California Winegrape PMA Project

Contact: Sandy Elles

Napa County Farm Bureau

707-224-5403 or ncfb@i-cafe.net



HANDS ON TRAINING FOR PESTICIDE APPLICATORS
EVENT ANNOUNCEMENT

Napa, CA – The Napa County Farm Bureau, Napa County Cooperative Extension and the Napa County Agricultural Commissioner proudly announce the 2002 Hands On Training event. The Hands On Training event will be held on March 27th at the Napa County Town and Country Fairgrounds in Napa.

This Training was created by the University of California Extension to better assist pesticide applicators with the proper procedures for the safe use and application of agricultural pesticides. This year, for the first time, a special focus has been created for Best Management Practices (BMP). The BMP learning module will incorporate training lessons for sulfur application in winegrapes including drift, personal protection, environmental protection, and employer responsibilities. BMPs have been steadily gaining a greater importance in today's agriculture industry as farmers shift towards more sustainable farming practices.

The goal of the program is to provide "hands on" training to applicators to teach them the proper methods of safe pesticide application and handling. The entire program will consist of hands-on training, in both Spanish and English, and will allow participants to receive personal experience with equipment and techniques.

The Hands On Training has traditionally been held every other year in Napa County. The winegrape industry feels that this invaluable training is important, as it relates to the health and safety of the community. All 400 plus available registration spaces filled illustrating the winegrape industry's support for education and safe handling with pesticides.

For more information on the event please contact the Napa County Farm Bureau at 707-224-5403 or ncfb@i-cafe.net.

The NCFB is a voluntary, non-profit, non-governmental organization whose basic goal is to ensure the proper political, economic, and social climate for the continuation of agriculture. Although often taken for granted, our strong agricultural heritage has contributed significantly to this country's standard of living. Today, NCFB strives to preserve land for agriculture and creates policies and programs that allow us to maintain the quality of life we have come to enjoy in our county.

###

Vineyard Open House Quick Reference

Objective of event:

To foster communication and positive relationships between Napa County vintners and growers and their neighbors.

Date of event:

Saturday, April 27th
3:00 – 4:30 p.m.

Locations

- ✓ American Canyon: Nord Coast Vineyard Service - Green Island Rd.
Contact: Julie Nord
- ✓ Carneros: Cuvaion Vineyard/Walsh Vineyard Mgt. - Duhig Road/Hwy. 12/121
Contact: Martin Mochizuki
- ✓ Napa North: Sterling/Mumm vineyard - corner of Oak Knoll and Hwy. 29.
Contact: Vince Bonotto
- ✓ Napa South: Robert Sinskey Vineyards - Brown's Valley
Contact: Kirk Grace
- ✓ Napa East: William Hill Winery – 1761 Atlas Peak Road, Napa
Contact: Glenn Salva
- ✓ Napa West: Renteria Vineyard Mgt. - corner of Redwood and Dry Creek Roads
Contact: Oscar Renteria
- ✓ Yountville: Napa Wine Co. - corner of Yountville Cross Road and Yount Mill Road
Contact: Sheldon Parker
- ✓ St. Helena/Rutherford: Beringer - York Creek vineyard
Contact: Bob Steinhauer
- ✓ Pope Valley: St. Supery - Hardister Ranch.
Contact: Josh Anstey
- ✓ Calistoga: Site located on Hwy. 29, before Tubbs Lane
Contact: Vince Arroyo

Vineyard Open House **Helpful Hints for Communication**

Before the event

- Send a personal event invitation to your neighbors. A template will be provided to each site host so you can customize the invitation flyer with your specific site information.
- Better yet, make a personal call or hand deliver an event flyer.
- Invite community leaders, including teachers, council members, and business owners with whom you are acquainted to attend the event.
- If appropriate, post flyers at local stores and gathering places.

Day of Event

- Introduce yourself and speak clearly and loudly.
- When sharing information, explain and be specific. People want to know what, how, why and when things are happening in the vineyard. Once people understand the reasoning and the timing, the fear or concern is often dispelled (see Talking Points).
- If you are unable to provide an answer a question posed by a guest, simply say, "I don't know, but someone will get back to you with an answer." Event coordinators will be on hand to get guest contact information and will follow up with answers to such questions shortly after the event.
- Consider having your vineyard manager and other workers on hand to provide person-to-person communication with neighbors. This helps put a face on the industry.
- Give out your business cards to neighbors.
- Listen. Sometimes it is the most valuable thing you can do.
- Don't forget to ask questions as well, and use this opportunity to get to know your neighbors.
- Bring wine to share – especially if it comes from the vineyard site featured during the event. *One case should be more than sufficient.* This will further enhance the connection your neighbor makes to the vineyard and will add a nice personal touch to your presentation.
- Relax and have fun!

General Good Neighbor Communication

- Follow up and respond in a timely manner. If someone calls with a question or concern, return the phone call within a day. Often people just want to hear an apology if you've made a mistake, or an explanation if they don't understand what is going on in your vineyard.
- Accommodate simple requests. Try to work out a compromise if a neighbor has a simple request.
- Don't make promises you can't keep. If you can't fulfill a request, just let the neighbor know that you are sorry, and why it is not possible.
- Try to notify your neighbors in advance of any operations that may cause concern or interest (e.g. sulfur applications, harvesting, work that will create dust). Let them know for how long they can expect the work to continue. Communicate with them also regarding changes in scheduled operations and let them know why (e.g. it was too windy, too wet, etc.). This reinforces your willingness to communicate with them and your commitment to caring for our natural resources.
- Lower noise levels when possible (e.g. limit number of tractors in one field at a time; test new equipment for noise levels before purchasing; keep equipment in safe and proper working order; have employees park cars away from residential areas and talk quietly during late night/early morning hours; fill equipment tanks away from neighborhoods).
- Consider inviting neighbors close in proximity to your vineyard(s) and/or winery to pre- or post-harvest activities or events. A pre-harvest effort subtly lets them know that a period of intense vineyard activity is approaching and they will perhaps be more understanding. A post-harvest activity is a great way to include them and to show your appreciation.
- Your neighbors can be your biggest headaches or your biggest fans. Most neighbor conflicts arise out of lack of knowledge. There are many benefits to a simple, personal communication from you.

Vineyard Open House

Talking Points and Information Guidelines

These talking points are merely meant to serve as a guideline to the information you will be sharing. These are some of the key points that event guests should understand at the end of the day. In addition, there will be NVVA, NVGGA, and Agricultural Commissioner staff members on hand at each site to assist guests with questions and information.

1. Share your **BACKGROUND, PERSPECTIVES** and **EXPERIENCES**. This information is interesting and important to your neighbors and helps personalize the experience.
2. Briefly describe **YOUR BUSINESS AND OPERATION** such as how many acres you own/farm and the various locations of your vineyards. Talk about the varieties produced, where you sell your wine (especially locally), and any other information pertinent to your business. If you are a vineyard management company – explain what that is.
3. Share some of the **CHALLENGES** of running a winery and/or a vineyard? Conversely, share some of the **MOST FUN or BEST** aspects of the business?
4. Discuss your own **VINEYARD PRACTICES** and the **WHY's** of these practices. Include information about the timing of your pesticide/material applications; equipment you use, etc. Use the **SEASONS** as your guide – share what you do throughout the year.
5. Consider bringing along some of the **COMMONLY USED VINEYARD TOOLS/EQUIPMENT** for guests to see and touch. Explain the uses.
6. Discuss general **WINE INDUSTRY PRACTICES** that may be confusing for the public or those of which they may not be aware (for example, why we harvest at night; the careful way in which we apply sulfur and other materials).
7. Explain **COMMON INDUSTRY TERMS** and what they mean (e.g. Brix). This makes community members feel like a part of the experience and they will be proud to share their knowledge with others in the future.
8. Discuss how you handle the **PROXIMITY OF RESIDENTIAL AREAS TO YOUR VINEYARD PROPERTIES**. If applicable, explain how you have changed or modified your operations to be more sensitive to neighbors.
9. Discuss **WHAT IS BEING DONE** by you and by other Napa Valley growers to encourage and practice **SUSTAINABLE FARMING (e.g. cover crops, IPM), WATERSHED RESTORATION, HABITAT DEVELOPMENT AND MAINTENANCE** as well as the reasons and benefits of these practices.
10. Prepare to discuss the **AGRICULTURAL PRESERVE** and what it means to the industry and the community.
11. You may be asked about the **GLASSY WINGED SHARPSHOOTER** and **PIERCE'S DISEASE**. Be prepared to discuss why the GWSS is a concern in our area and what PD does to a vine.
12. Brush up on the **FARMWORKER HOUSING** issue in case you are asked about it.

DID YOU KNOW?

Facts about the Napa Valley wine industry that may surprise you

◀ OPEN SPACE PRESERVATION ▶

While it may appear to the casual observer that Napa County is bursting with grape vines, the truth is only eight percent of Napa County is planted in vineyards and less than three percent remains suitable for grape planting. Napa County encompasses 485,120 acres in total and just 40,016 acres are planted in vineyards. In 1968, Napa Valley vintners and others in the community had the forethought to preserve open space and prevent future over-development of 30,000 acres by enacting the nation's first Agriculture Preserve. Since its adoption, not one acre of land has been removed from the preserve. In addition, local landowners have placed over 11,000 acres of agricultural land in the Land Trust of Napa County, ensuring their land will never be developed. Another 16,000 acres are protected under the Williamson Act, a program that provides incentives to keep land in agriculture production and open space.

◀ SUSTAINABLE FARMING ▶

Napa Valley vintners and growers are at the forefront of sustainable farming practices and innovations, including those that address the responsible use of pesticides. The Napa Valley Vintners Association supports the Napa Sustainable Winegrowers Group – a group dedicated to promoting sustainable farming practices including natural farming, Integrated Pest Management (IPM), pesticide reduction or elimination and, restoration of natural habitats on vineyard properties. Interestingly, the “pesticide” most commonly used in Napa Valley is sulfur. Sulfur, an organic fungicide, is used to control mildew and rot in fruits and ornamental plants. Sulfur is a natural compound found in mineral form in both aquatic and soil environments, and is certified for use in organic farming. It is important to note that the use of pest control products does not necessarily mean exposure. To protect themselves, their families and the environments in which they live and work, farmers and farm workers must conform with strict precautionary measures as specified on each product label, as required by the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation. In fact, California maintains the highest standards for pest control in the nation. As a community, Napa Valley vintners and growers support the reduction, and whenever possible, the elimination of chemical pesticides and synthetic fertilizers. Between 1999 and 2000, pesticide use in Napa County decreased by 10%. In addition, use of pesticides other than sulfur decreased by 40% during that same period. The Napa Valley Vintners Association is currently working with other industry groups and the environmental community to develop standards for vineyard planting and operations, which would qualify for “Green Certification.” The purpose of the Napa Green Certification Program is to develop a voluntary program where Napa Valley grape growers can participate in a “farm planning” process that will enhance the watershed and restore habitat with sustainable agriculture while addressing local, state and federal regulations.

◀ **FARMWORKER HOUSING** ▶

We recognize how vital farmworkers are to our industry. Many migrant workers stay with family members or friends during the harvest season. However, many require temporary shelter while they are working in the Valley. The Napa Valley Vintners Association is working actively with others in the agricultural and housing communities, as well as the County of Napa, to provide additional housing for both permanent and seasonal farm workers. Recently, the Napa Valley wine industry raised money through a voluntary assessment to address immediate housing needs. A portion of these funds was used to purchase twelve yurts, which are stable, comfortable and mobile structures. The yurts provided much needed housing for the 2001 harvest. Additionally, Napa Valley vintners worked with state lawmakers, sponsoring legislation to create a permanent assessment on Napa County vineyard land. Proceeds will fund continuing housing needs for migrant farmworkers in our valley. The local economy depends in part on the skill and dedication of seasonal farmworkers – it's important to us that they are treated well. The industry also worked with the County to commission a reliable study to help define the amount of housing needed and the best locations for housing so we can better plan for the future. The Napa Valley Vintners Association, through the Napa Valley Wine Auction, has dedicated more than \$2 million to local organizations to fund affordable housing projects, including those that house seasonal farm workers.

◀ **WATERSHED HEALTH AND MANAGEMENT** ▶

Napa County vintners and farmers are committed to preserving the health of the local watershed. Several growers who are located near creeks and streams have formed watershed stewardship groups comprised of neighbors working together to restore and/or maintain the health of their watershed. Members of the winegrape community, other environmentalists, and county officials are working toward implementing the recommendations of the Watershed Task Force in the form of new conservation regulations. These regulations will go even farther than the historic Hillside Ordinance (enacted in 1991 to prevent erosion), by including provisions for habitat and native plant maintenance. Most growers in Napa Valley use natural methods of erosion control, such as cover crops to reduce dust and runoff and to preserve topsoil. Vineyards and surrounding open space provide a natural habitat for a variety of wildlife species and many growers invite birds, including owls and hawks, into their vineyards by installing special protective bird boxes. The birds of prey are a natural control for rodent and pest populations in and around the vineyards.

◀ **GLASSY WINGED SHARPSHOOTER** ▶

While the State of California enacted emergency regulations to stop the spread of the GWSS, it is the consensus of the Napa Valley wine industry that these regulations do not go far enough. As a result, Napa County has enacted the toughest regulations in the state. One of the most significant reasons for these tougher regulations is so that we are never put in the position of having to utilize pesticides to combat the glassy winged sharpshooter. The Napa Valley plan was developed by the Glassy Winged Sharpshooter Action Team -- the Napa County Agricultural Commissioner, the wine industry, the nursery industry, and environmental groups. As a testament to the wine industry's commitment to excluding the GWSS, in 2001 the NVVA sponsored state legislation that will allow a special assessment on vineyard land in Napa County. Funds from this industry driven assessment will help fund exclusion and inspection efforts. Exclusion of the pest, along with detection as the first line of defense, is the top priority.

◀ **WATER CONSERVATION** ▶

Water is the lifeblood of any agricultural crop, including the wine grapes of Napa Valley. Our vintners view local groundwater as a precious natural resource, to be used wisely and efficiently. By using a variety of modern tools, including software programs, vintners are able to analyze irrigation patterns and monitor local climate to ensure the best, most efficient use of local water. In addition, water management science and innovation, such as drip irrigation and micro-sprinkler systems, help ensure ongoing water conservation by Napa's growers.

◀ **GIVING BACK TO THE COMMUNITY** ▶

Napa Valley vintners are dedicated to the community. The Napa Valley Wine Auction, first held in 1981, is the world's most successful wine charity event with all of the proceeds staying within Napa County. Today, auction-goers from across the United States and a growing number of international guests travel to the Napa Valley each June to participate in the gala weekend. Yet, the heart of the auction remains rooted in the concept of neighbors helping neighbors. In 1999, the NVVA committed \$3 million in Wine Auction Health Care Funds for a new \$8 million health center in Napa to provide a centralized shared facility for local nonprofit agencies which serve the community. In 2001, the Napa Valley Vintners Association contributed \$7.2 million to 27 local non-profit programs and community organizations. Some of these include Healthy Mom's and Babies, Clinic Ole, Garden Haven/Adult Day Care, Sister Anne's Dental Clinic, Hospice of Napa Valley, Boys and Girls Club, Matrix, Nuestra Esperanza, and Napa Valley Community Housing. Through the auction, the NVVA has donated more than \$37 million to Napa County health care, youth development and affordable housing organizations over the past 21 years.



For further information about the Napa Valley wine industry or the Napa Valley Vintners Association please visit our Web site at www.napavintners.com

Suggested Guidelines for Lodi Public Educational Event(s)

Title

Something simple like “A Vineyard Open House”

Purpose of Event

Improve understandings and relationships between growers and neighboring communities

Helpful Hints for Advertising the Event and Communication at the Event

See attached *Helpful Hints* for how and who to invite and how to interact with the public audience during the event.

Suggested Agenda (1.5 hours total) – informal and easy going is key

5 minutes

Host Grower

Welcome & Overview, i.e. to share with neighbors what’s, how’s, why’s, and when’s of vineyard operations.

10 minutes

LWWC Integrated Farming Program rep (Cliff O./Lisa M.)

Brief history of LWWC and its objectives; impt of farming to region; promotion and adoption of sust farming systems here; descript/demo of Lodi Winegrower’s Workbook; consider introducing SWP – noting develop of statewide self-assessment workbooks for vineyard and winery modeled from the WONDERFUL Lodi example.

*consider distributing a handout(s) highlighting features of winegrape production in Lodi-Woodbridge area, LWWC’s efforts, etc. (see attached *Did You Know* fact sheet developed for Napa’s vineyard open house prgm)

5 minutes

PMA representative (Joe B./other)

Brief history and focus of Winegrape PMA. Talk in generalities instead of sulfur and herbicides specifically, i.e. prgm developed to share info statewide on sust practices for managing pests. Thrust is to sustain viticulture by empowerment of Eng-speaking agriculturists, Span-speaking agriculturists, and public with practical info useful for the sustainable management of pests and for improving human interactions.

30-45 minutes

Grower(s) Discussion (Lodi-Woodbridge grower(s))

Suggest using elements of attached *Talking Points*. Manage interaction to keep discussion upbeat and productive, avoid confrontation.

Although event may be scheduled to coincide with a specific operation (e.g. sulfur dusting), grower(s) should briefly and clearly describe key operations and challenges over the entire season – empowering the public with some idea of how you think about things, what you do, and when you do it. Emphasize your desire to make informative, smart decisions that keep you in business but preserve human and environmental safety. Consider having commonly used equipment available for guests to touch and see.

IMPORTANT - stress how you adjust operations around sensitive areas (especially neighbors). Use powdery mildew management as a model. Note reasoning for having to control mildew. Note benefits to using sulfur products – esp. dust (natural element found in soil/water, organic material, effective and safe, etc.). Discuss how you adjust applications to be more sensitive of neighbors (carefully monitoring wind speed and direction, reasoning for nighttime applications, managing rows nearest residences differently, keeping operations as quiet as possible, using the powdery mildew index, etc.). Consider asking audience for their ideas?

Remaining time

Wine & Snacks

End with wine (made from grapes from that or regional vineyards) & snacks, and very casual, relaxed conversation.



A Stroll Through The Vineyard

**Local growers invite you and your neighbors to
an afternoon *Stroll through the Vineyard*,
Saturday, May 11 from 4:00 to 5:30pm, the
vineyard is located on the west side of Atkins Rd.
¼ mile south of Stampede Rd.**

**Included will be a relaxing wine and cheese
reception.**

**Please wear walking shoes and join us for an
experience of grape growing in your backyard,
the vineyards of Clements and Lockeford.**

**Sponsored by the Lodi District Grape Growers Association and the Lodi-
Woodbridge Winegrape Commission.**

**For questions, contact Lisa May at the Lodi-Woodbridge Winegrape
Commission, 209.367.4727**



PRINCIPAL INVESTIGATOR

Karen Ross
President, California Association of
Winegrape Growers

PROJECT COORDINATOR

Joe Browde
Private Consultant

STEERING COMMITTEE

Jeff Bitter
Allied Grape Growers
Mike Boer
Mendocino Winegrowers Alliance
Nick Frey
Sonoma County Grape Growers
Patrick Gleeson
American Vineyard Foundation
Jon Holmquist
Canandaigua Wine Company
Rhonda Hood
California North Coast Grape Growers
Steve Kautz
Calaveras Wine Association
Randy Lange, Steve Quashnick
CAWG
David Lucas
Lucas Winery
Kelly Maher, Julie Nord, Katey Taylor
Napa Valley Grape Growers
Kris O'Connor
Central Coast Vineyard Team
Cliff Ohmart
Lodi-Woodbridge Winegrape Commission
Jason Smith
Monterey County Grape Growers
Ken Wilson
Clarksburg Wine Growers

TECHNICAL ADVISORS

Kendra Baumgartner
US Department of Agriculture ARS
Larry Bettiga, Kurt Hembree,
George Leavitt, Mario Moratorio,
Ed Weber
University of California Coop. Extension
Jenny Broome
University of California Sustainable
Agriculture Res. and Educ. Program
Sewell Simmons
Department of Pesticide Regulation
Ann Thrupp
US Environmental Protection Agency

The California Winegrape Pest Management Alliance

**A Partnership between the
California Winegrape Community and the
Department of Pesticide Regulation
to Promote Sustainable Practices**

The California Winegrape Pest Management Alliance (PMA) is a statewide grower-driven collaboration with the Department of Pesticide Regulation (DPR) to promote reduced-risk pest management in winegrapes.

The California Association of Winegrape Growers (CAWG) provides organizational leadership, and a Steering Committee, comprised of representatives from regional and statewide winegrape organizations, guides efforts.

Funding is provided by DPR through its Pest Management Alliance Grants Program. More than 50% of costs are shared by CAWG and through in-kind contributions from regional organizations and growers.

California Winegrape Pest Management Alliance
Phone (707) 776-4943 • Fax (707) 776-4540 • mjbrowde@pacbell.net

California Association of Winegrape Growers
Phone (916) 924-5370 • Fax (916) 924-5374 • info@cawg.org

Investigador Principal

Karen Ross
President, California Association of
Winegrape Growers

Coordinador de Proyecto

Joe Browde
Private Consultant

Comité Guía

Jeff Bitter
Allied Grape Growers
Mike Boer
Mendocino Winegrowers Alliance
Nick Frey
Sonoma County Grape Growers
Patrick Gleeson
American Vineyard Foundation
Jon Holmquist
Canandaigua Wine Company
Rhonda Hood
California North Coast Grape Growers
Steve Kautz
Calaveras Wine Association
Randy Lange, Steve Quashnick
CAWG
David Lucas
Lucas Winery
Kelly Maher, Julie Nord, Kate Taylor
Napa Valley Grape Growers
Kris O'Connor
Central Coast Vineyard Team
Cliff Ohmart
Lodi-Woodbridge Winegrape Commission
Jason Smith
Monterey County Grape Growers
Ken Wilson
Clarksburg Wine Growers

Consultores Técnicos

Kendra Baumgartner
US Department of Agriculture ARS
Larry Bettiga, Kurt Hembree,
George Leavitt, Mario Moratorio,
Ed Weber
University of California Coop. Extension
Jenny Broome
University of California Sustainable
Agriculture Res. and Educ. Program
Sewell Simmons
Department of Pesticide Regulation
Ann Thrupp
US Environmental Protection Agency

Alianza de Control de Pestes en Uvas de Vino de California

**Es una Asociación entre la Comunidad de Uvas
de Vino de California y el Departamento de
Reglamentación de Pesticidas (DPR, por su sigla
en inglés) para Promover Prácticas Sustentables**

La Alianza de Control de Pestes en Uvas de Vino de California (PMA, por su sigla en inglés) es una colaboración guiada por agricultores a través del estado y con el Departamento de Reglamentación de Pesticidas (DPR) para promover control de riesgo reducido de pestes en uvas de vino.

La Asociación de Agricultores de Uvas de Vino (CAWG, por su sigla en inglés), provee liderazgo organizacional. Además, un Comité Guía, compuesto por representantes regionales y de organizaciones de uvas de vino a través del estado, guía los esfuerzos.

Los fondos provienen del DPR a través de su Programa de Alianza de Control de Pestes. Más del 50% de los costos son compartidos por CAWG y por organizaciones regionales y agricultores.

California Winegrape Pest Management Alliance
Phone (707) 776-4943 • Fax (707) 776-4540 • mjbrowde@pacbell.net

California Association of Winegrape Growers
Phone (916) 924-5370 • Fax (916) 924-5374 • info@cawg.org

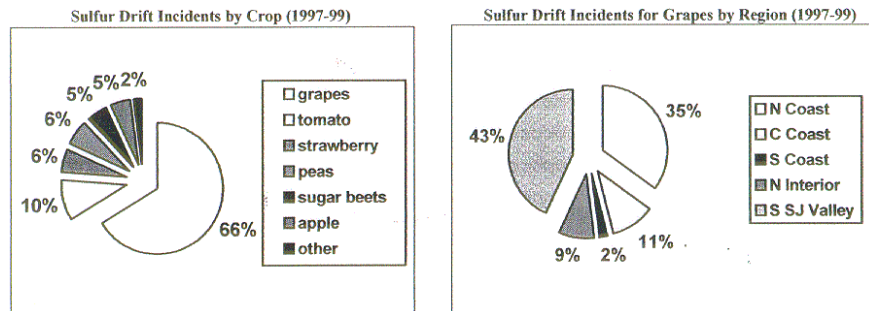
Best Management Practices for Sulfur in Winegrapes

Sulfur is a natural element used safely for centuries to control plant pathogens and mites. As an active ingredient, sulfur is the leading pesticide used in California agriculture. It is an important and effective tool for managing powdery mildew – one of the major diseases affecting grapes throughout the world. Uncontrolled mildew seriously reduces winegrape yields and quality.

Human exposure to sulfur can cause eye and skin irritation and breathing difficulty – especially in sensitive individuals. But, compared to most pesticides, it has minimal effects on humans and the environment. In fact, sulfur use is approved for organic farming.

So, what is the concern?

Reports of sulfur drift have occurred in recent years. A survey by the Department of Pesticide Regulation found 86 reported incidents of sulfur drift during 1997 to June 1999. Two thirds of the reports cited grapes as the target source, distributed throughout all winegrape regions. Moreover, 80% of reports for grapes were attributed to dust applications. Incidents included dust drifting onto surrounding structures, such as neighboring residences, schools, and places of business. Dust drift onto workers in surrounding fields and moving vehicles also was reported.



Dusting sulfur constitutes the foundation for powdery mildew control in grapes throughout California. In fact, a majority of winegrape acres are treated with dusting sulfur each year – many treated repeatedly. However, public complaints of sulfur drift have increased. Why? The key factor seems to be the increase in agricultural/urban interfaces.

Uses of sulfur best management practices will minimize the potential for drift from treated vineyards, especially onto surrounding “sensitive areas”. Dusting sulfur must be managed with particular care because of its high visibility and susceptibility to offsite movement by wind.

What are sensitive areas?

Sensitive areas are locations surrounding vineyards where people, organisms, or structures could be exposed to pesticides. For sulfur, these areas include schools, bus stops, busy roadways, residences, or other areas of human activity. Sulfur sensitive areas also can include nearby crops (such as pears) and waterways.

How to reduce the potential for drift and avoid incidents?

The following practices can be integrated into programs for managing sulfur that achieve mildew control while preventing drift and public complaints. A management plan should be developed incorporating those practices appropriate for each grower’s vineyard and circumstances. Applicators must understand the plan as it relates to the geography of the vineyard and surrounding areas.

Best Management Practices

- *Being a Good Neighbor.* Sulfur stewardship includes being aware of the concerns of neighbors and local communities. Consider a policy of discussing vineyard actions with neighbors, speaking with community organizations about the importance of sulfur as a relatively benign crop protection tool, and forming a regional team of growers to serve as the first contact with the public for negotiations and troubleshooting. These actions enable mutual understandings and better relations, thus decreasing the probability of complaints.
- *Canopy Management.* Use trellis systems and canopy thinning techniques (e.g., leaf pulling, shoot thinning, cane cutting) that open canopies to recommended levels. Besides benefiting fruit quality, a properly opened canopy provides conditions less conducive to mildew and other diseases, potentially enabling use of lower sulfur rates and fewer applications for achieving adequate coverage.
- *Monitoring Mildew Development.* Use the powdery mildew index as a tool for optimally timing and possibly reducing the frequency of fungicide applications (including sulfur).
- *Establishing Buffers.* Establish reasonable buffer zones to prevent drift onto sensitive areas and human exposure to applications. Buffer distances vary with weather conditions, formulation (dust/wettable), application method (ground/air), presence of barriers (e.g., trees), and characteristics of sensitive areas. If buffers determined for dust application overlap some border vine rows, apply separate fungicide sprays (less prone to drift) to these rows or dust border rows during conditions when buffers can be reduced.
- *Dealing with Extra-Sensitive Areas.* Consider applying wettable sulfur or other low-risk fungicide sprays to parts of or entire vineyards near extremely sensitive areas.
- *Selecting Rates.* Adjust rates of sulfur or other fungicides to the lowest effective rate according to vine growth and development. Higher label rates may not be required early in the season to achieve adequate coverage. Use of lower rates decreases risks of pesticide drift, particularly for dusting sulfur.
- *Equipment Operation.* Maintain, calibrate, and select application equipment to deliver the intended rate as accurately and quietly as possible. For dust, be extra cautious of drift during row turns and reduce RPM at row ends or shutoff dusting equipment if possible.
- *Weather Monitoring.* Monitor weather conditions before and during applications. No sulfur applications can be made when winds exceed 10 miles per hour, but consider using an even lower threshold. Avoid applications when winds are blowing towards sensitive areas and during temperature inversions.
- *Timing Applications.* Decrease public visibility and the potential for complaints by making applications during periods of least human activity (e.g., at night, weekends). Develop a sequence for application that attracts the least attention. For nighttime applications, minimize “noise” complaints by treating rows closest to residential areas first.
- *Resistance Management.* Although mildew resistance to sulfur has never been found, consider rotations with other fungicides as a preventive measure against resistance and sulfur drift.

The winegrowing community must be proactive in resolving important environmental and social issues. Addressing the issue of public complaints of sulfur drift is no exception. The greater use of sulfur best management practices should decrease drift incidents, prevent further regulation, and retain sulfur as a viable organic tool for agricultural production.

Produced by the California Winegrape Pest Management Alliance, a partnership between the California winegrape community and the Department of Pesticide Regulation (DPR). Funding is provided by grants from DPR.

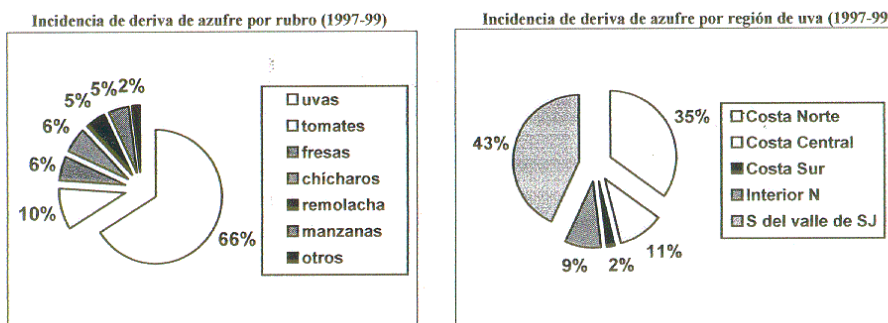
Las Mejores Prácticas Para el Manejo de Azufre en los Viñedos para Vino

El azufre es un elemento que ocurre en la naturaleza y que se ha usado por centenares de años para el control de plagas. El azufre como ingrediente activo es el pesticida de más uso en la agricultura de California. Es un producto efectivo e importante para el control de la cenicienta polvorienta conocida también como mildiú, una de las enfermedades más importantes que ataca a la viña en todo el mundo. La falta de control de mildiú puede causar reducciones importantes de rendimiento y calidad en las uvas para vino.

El ser expuesto al azufre puede ocasionar en el hombre, irritación en los ojos y la piel y dificultades en respirar, especialmente en los individuos sensibles. Pero en comparación con la mayoría de los pesticidas, tiene un efecto mínimo en los seres humanos y en el medio ambiente. De hecho, el uso de azufre está aceptado en la producción orgánica.

¿Entonces, cuál es la inquietud?

En los últimos años han habido denuncias de deriva de azufre hacia los vecinos. Una encuesta hecha por el Departamento de Reglamentación de Pesticidas encontró que de 1997 a Junio de 1999 hubo 86 denuncias de deriva de azufre. En dos tercios de los informes, las aplicaciones estaban dirigidas hacia viñedos. Dichas denuncias estaban distribuidas por todas las regiones de uva para vino. Es más, el 80% de las denuncias hechas en uvas fueron atribuidas a las aplicaciones de azufre en polvo. Los incidentes incluyen la deriva de polvo sobre estructuras adyacentes, como ser residencias, escuelas y negocios vecinos. También se reportó deriva de azufre en polvo sobre trabajadores en campos y vehículos en el vecindario.



Por toda California, el uso de azufre en polvo es la base del manejo de mildiú en uvas. Es más, la mayoría de los acres donde se crece uva para vinos son tratados con azufre en polvo todos los años y muchos son tratados repetidas veces. Sin embargo, han aumentado las quejas del público sobre el arrastre de azufre. ¿Porqué? La razón principal aparenta ser un aumento en la proximidad de las zonas agrícolas a las zonas urbanas.

El uso de las “Mejores Prácticas para el Manejo de Azufre” disminuye el riesgo de que ocurran derivas provenientes de viñedos tratados, especialmente en los alrededores de “áreas sensibles”. La aplicación de azufre en polvo debe de ser manejado con extremo cuidado debido a su alta visibilidad y a la posibilidad de ser movido por el viento fuera del viñedo.

¿Cuáles son las áreas sensibles?

Las áreas delicadas son aquellas localidades adyacentes al viñedo donde gente, animales o estructuras pueden estar expuestas a los pesticidas. En el caso del azufre, estas áreas incluyen escuelas,

paradas de autobús, calles o caminos concurridos, viviendas y otras áreas habitadas por el hombre. Áreas sensibles al azufre también puede incluir cultivos linderos (como ser huertas de peras) y cursos de agua.

¿Cómo se puede reducir el riesgo de arrastres y cómo se puede evitar incidentes?

Las siguientes prácticas pueden ser integradas en el programa para el manejo de azufre obteniendo control de mildiú al mismo tiempo evitando la deriva y las quejas del público. Cada productor debe desarrollar un plan de manejo incorporando las prácticas apropiadas para sus circunstancias. Quienes aplican el azufre deben de comprender dicho plan en relación a la topografía del viñedo y las áreas linderas.

Las mejores prácticas de manejo

- (a) *Ser un buen vecino.* La correcta administración del azufre incluye estar al tanto de las inquietudes de los vecinos y las comunidades locales. Platique con sus vecinos de las prácticas que usted efectúa en su viñedo, hable con organizaciones de la comunidad sobre la importancia del azufre como una herramienta relativamente benigna para la protección de los cultivos, y establezca un grupo regional de productores para servir de primer contacto con el público para negociar y solucionar problemas. Estas acciones establecen un entendimiento mutuo y crean mejores relaciones, por lo cual decrecen las posibilidades de recibir quejas.
- (b) *Manejo del follaje.* Use espalderas y técnicas para desahijar (como ser deshojar, desahijar el retoño, podar la caña) para abrir el follaje a niveles recomendados. Además de beneficiar la calidad de la fruta, cuando se abre el follaje correctamente se crean condiciones que son menos propicias al mildiú y otras enfermedades, haciendo posible que se disminuya la cantidad o el número de aplicaciones de azufre y obteniendo una cobertura adecuada.
- (c) *Monitorear el desarrollo de mildiú.* Use el índice desarrollado para mildiú para determinar cuando es el tiempo óptimo para aplicar un fungicida y posiblemente reducir la frecuencia de las aplicaciones de fungicidas (incluyendo el azufre).
- (d) *Establezca zonas de contención.* Establezca zonas razonables de contención en las cuales no se aplica azufre para prevenir la deriva hacia áreas sensibles y para evitar exponer a la gente a la aplicación. Las zonas de contención varían con las condiciones climáticas, la formulación del producto (polvo, soluble), el método de aplicación (por tierra, avión), la presencia de barreras (ej. árboles), y las características de las áreas delicadas. Si la zona de contención abarca algunos surcos a la orilla del viñedo, aplique otro fungicida (uno que no cause deriva) en estos surcos o aplique el polvo bajo aquellas condiciones donde se puede disminuir el tamaño de la zona de contención.
- (e) *En áreas extremadamente sensible.* Considere aplicar azufre mojable u otro fungicida de bajo riesgo a partes o a todo el viñedo que se encuentra cerca de áreas que son extremadamente delicadas.
- (f) *Dosis selectivas.* Ajuste la dosis de azufre u otro fungicida a la dosis efectiva más baja dependiendo del crecimiento y desarrollo de la viña. Temprano en la estación puede que no se requieran dosis altas para obtener una cobertura adecuada. El uso de bajas dosis decrece el riesgo de arrastre de pesticidas, especialmente en el caso de azufre en polvo.
- (g) *Mantenimiento del equipo.* Mantenga, calibre y elija el equipo para aplicar la dosis estipulada con la mejor precisión y con el mayor silencio. Cuando aplique azufre en polvo tome extra precaución para evitar la deriva al doblar el surco y disminuya las revoluciones, o si es posible, apague el equipo al final del surco.
- (h) *Monitoreo de las condiciones meteorológicas.* Monitoree las condiciones climáticas antes y durante la aplicación. No se puede aplicar azufre cuando el viento excede 10 millas por hora, pero considere usar un umbral más bajo. Evite hacer una aplicación cuando el viento va en dirección hacia áreas delicadas o cuando hay una inversión de temperaturas en la atmósfera.
- (i) *Periodo de aplicación.* Haga las aplicaciones en períodos de menor actividad humana (ej. en la noche o durante el fin de semana) para disminuir la visibilidad al público y la posibilidad de recibir quejas.

Desarrolle un esquema de aplicaciones para no atraer atención. Cuando efectúe aplicaciones durante la noche, comience cerca de las residencias vecinas para evitar tener quejas por el ruido.

- (j) *Manejo de resistencia.* Si bien el mildiú no ha desarrollado resistencia al azufre, considere la rotación con otros fungicidas para prevenir desarrollar resistencia y evitar causar deriva.

La comunidad de productores de uvas para vino debe tomar la iniciativa en resolver problemas sociales y del medio ambiente. Esto incluye tratar de resolver las quejas hechas por el público sobre la deriva de azufre. El mayor uso de las “Mejores Prácticas para el Manejo de Azufre” permitirá lograr menos incidentes de deriva, prevenir más reglamentaciones gubernamentales y permitir la retención del azufre como un instrumento orgánico viable en la producción agrícola.

Producido por la Alianza de Control de Plagas en Uvas de Vino de California, una asociación entre la comunidad de Productores de Vinos de California y el Departamento de Reglamentación de Pesticidas (DRP). Los fondos fueron proporcionados por DRP.

Traducido por Lucia G. Varela, **Universidad de California.**

Instructors Guide

Sulfur Dust Stewardship and Safety

▪ **Learning Objectives**

On completing this module, participants will understand:

1. Why sulfur dust drift is an important issue
2. What are sulfur-sensitive areas
3. How to avoid sulfur drift to sensitive areas and public complaints
4. How to safely handle and apply sulfur dust
5. The safe operation of dusting equipment.

▪ **Equipment and Props for Hands-On Training**

- Display with charts of sulfur drift incidents
- Schematics of vineyards near sensitive areas (e.g., school, houses, busy road)
- Wind gauge
- Long-sleeved shirts
- Long pants
- Waterproof gloves
- Shoes plus socks
- Protective eyewear
- Display with photos of old and new dusting equipment

▪ **Handouts**

- *Best Management Practices for Sulfur in Winegrapes* (California Winegrape Pest Management Alliance)
- *Sulfur Best Application Practices* (Coalition for Urban/Rural Environmental Stewardship)
- Product Label and Material Safety Data Sheet for sulfur dust
- Photos of safety stickers on dusters
- Photos showing don'ts like putting bare hand into hopper with no shields

Instruction Outline

1. Introduction (2 minutes)

Introduce yourself and tell students the learning objectives:

- To understand why sulfur dust drift is an important issue
- To identify sulfur-sensitive areas and ways to avoid sulfur drift and public complaints
- To review the safe handling and application of sulfur dust and safe operation of dusting equipment.

Explain that the format here differs from other sessions in that various aspects of sulfur dust use and safety will be covered – stewardship, personal protective equipment (PPE), human and environmental hazards, and loading and applying.

2. Sulfur Dust Drift is an Important Issue (5 minutes)

Discussion – Drift Incidents: Show the display with charts from *Best Management Practices for Sulfur in Winegrapes*. Tell students that information is for incidents of sulfur drift in California during 1997-1999. Ask what the important points are:

- Most incidents of sulfur drift resulted from applications to grapes
- Sulfur drift incidents occur all over California (it's a statewide problem).

Emphasize that sulfur drift incidents have increased and that 80% are for dust. Ask why incidents have increased and so many involve dust.

- Less distance between farms and urban areas, leading to more drift complaints
- Cheap and effective sulfur dust is the most widely used fungicide on grapes (controls powdery mildew, the most important grape pest)
- Sulfur dust is easily visible and very susceptible to drift

Emphasize that sulfur dust drift is the #1 pesticide complaint and that incidents must be reduced. If not, sulfur products (especially dust) could be further regulated or banned.

3. Minimizing Drift and Public Complaints (20 minutes)

Discussion – Identify Sensitive Areas: Emphasize that it is important to first identify areas near fields where drift could cause complaints. It is important to be especially careful in managing sulfur dust near these areas. Ask students to list some “sensitive areas” and describe what makes them sensitive (human activity).

- Schools • Bus stops • Busy roadways • Homes or occupied buildings

Note that sulfur-sensitive areas include nearby susceptible crops and waterways.

Discussion – Stewardship: Ask students what factors can be managed to minimize sulfur drift and public complaints. Discuss the following 10 factors from *Best Management Practices for Sulfur in Winegrapes*. Emphasize factors that students can influence.

- **Being a good neighbor.** Be aware of neighbor concerns and improve communications and understandings with them. Ask students how to deal with an angry neighbor about sulfur drift (stop the application and call the boss).
- **Canopy management.** By properly managing and thinning the canopy, it may be possible to use lower rates and fewer applications.
- **Monitoring mildew development.** Using the powdery mildew index to help time applications may reduce the frequency of applications (briefly explain the index).
- **Establishing buffers.** Set buffers to prevent sulfur drift to sensitive areas.
- **Dealing with extra-sensitive areas.** Consider applying sprays in these situations.
- **Selecting rates.** Use lowest effective rates based on vine growth.
- **Equipment operation.** Maintain and calibrate equipment to deliver the intended rate accurately and quietly. Shutoff dusting equipment at row ends if possible.
- **Weather monitoring.** Monitor weather before and during applications. Do not apply sulfur when winds exceed 10 miles per hour, although a minimum air movement of 2 miles per hour is recommended. Avoid applications when winds are blowing towards sensitive areas.
- **Timing applications.** Decrease public visibility by making applications at night or during other periods of minimal human activity.
- **Resistance management.** Consider rotating sulfur with other fungicides.

Problem-Solving Exercise: Show students the schematics of vineyards near sensitive areas. Ask what can be done to minimize sulfur drift and complaints. Or, divide students into groups, give each group one schematic, and have groups discuss and present tactics. (e.g., nighttime applications, monitoring and adjusting for winds, shutting off at row ends, not dusting vines nearest sensitive areas, and using sprays instead of dust)

Discuss ways to estimate wind speed. Display a wind gauge. Note who is responsible for monitoring winds (the applicator is).

4. Worker and Environmental Safety – Sulfur Dust Label (10 minutes)

Emphasize that the label is the legal document for safety and use information. For this section, have students find appropriate information on the label.

Discussion – Signal Word and PPE: Have students identify the signal word and discuss its meaning (CAUTION: slightly toxic or relatively non-toxic, low hazard). Ask students to determine PPE required for handlers and applicators:

- Long-sleeved shirt
- Long pants
- Waterproof gloves
- Shoes plus socks
- Protective eyewear; safety goggles or glasses with side shields and brow protection.

Discussion – Hazards to Humans and Animals: Ask about these hazards:

- Causes moderate eye, skin, and throat irritation
- May cause breathing difficulty
- Harmful if absorbed through skin.

Emphasize the importance of starting each work day with clean PPE and clothing. Remind students to wash before eating, drinking, smoking, or using the toilet.

Discussion – Environmental Hazards: Ask if sulfur dust is a hazard to the environment. (Although not a serious environmental hazard, spills and drift must be avoided.)

Discussion – Physical Hazard: Ask if sulfur dust suspended in air presents risks. (It ignites easily – avoid heat, sparks, or flame. Do not smoke while applying.)

Discussion – Restricted Entry Interval: Ask what the restricted entry interval is. (Do not enter treated areas for 24 hours after application – becomes 3 days for San Joaquin County after May 15, 2001. For earlier entry, appropriate PPE is required.)

Discussion – Application Precautions: Ask:

- Why sulfur should not be applied in the early afternoon during 100°F temperatures? (At high temperatures, sulfur can burn foliage/fruit. Also, sulfur dust is flammable – tractor, hopper, vines could ignite.)
- Why sulfur should not be applied within 2 weeks of an oil spray (burn foliage/fruit)?
- What are some sulfur-sensitive crops and what precautions should be taken when applying sulfur near them (same as that for other sensitive areas)?

Discussion – Storage and Disposal: Ask how and when to dispose of sulfur bags.

- Empty bags can be burned on site. San Joaquin County ordinance states that sulfur bags must be burned on the day emptied. AVOID smoke – it is toxic.
- Empty bags can be taken to an approved waste disposal facility.
- Store dust in original container only and keep sealed. Store in closed storage areas.

5. Worker Safety – Sulfur Dusters (5 minutes)

Discussion – Safe Operation of Dusting Equipment: Present display with photos of old (three-point model) and new (tow-behind model) dusters. Have students discuss important aspects about safety. Discussion can include:

- Proper and improper protective shields for belts, fan, and mixing shaft.
- The importance of safety decals (note the 5 decals on the new duster).
- How to properly remove a bag caught in the mixing shaft (contrast to photo – rubber gloves must be worn and the mixing shaft turned off).
- The importance of shutting off the tractor engine and allowing all movement to stop before leaving the tractor to adjust, lubricate, or unhook the duster.
- Why hands and loose clothing must be kept away from power-driven parts.
- Why all guards should be in good condition and firmly in place.
- The benefits of the step on the side of the new duster (enables easy and safe pouring).
- Where to stand when adding sulfur (to the side with the wind blowing away).
- The benefits of the storage box on the front of the new duster (stores extra bags).
- The benefit of being able to shut off the flow of sulfur while driving the tractor (note sulfur distribution lever on new duster).
- Stopping the application if the applicator is excessively tired or his vision is obscured.
- Use common sense when operating dusters and refer to equipment manuals.

6. Wrap-Up and Conclusion (3 minutes)

Remind students about carefully managing sulfur to prevent drift problems. Ask students if they have questions on sulfur stewardship or worker safety. In conclusion, point out that each person can make a difference with safely using sulfur.

Guía para Instructores

Buenas Prácticas y Uso Seguro de Azufre en Polvo

• **Objetivos de Aprendizaje**

Al completar este ejercicio los participantes comprenderán:

1. Porqué el tema de la deriva de azufre en polvo es importante
2. Cuales son las áreas 'delicadas' o sensibles al azufre
3. Como evitar la deriva de azufre a áreas sensibles y como evitar quejas hechas por el público
4. Como manejar y aplicar con seguridad azufre en polvo .
5. Como manejar con seguridad el equipo para aplicar azufre.

• **Equipos y Materiales Necesarios para el Entrenamiento Práctico**

- Carteles con gráficos de incidentes de deriva de azufre
- Esquemas de viñedos cerca de áreas delicadas (ej. Escuelas, casas, caminos concurridos)
- Medidor de viento
- Camisas de mangas largas
- Pantalones largos
- Guantes impermeables
- Zapatos y medias
- Gafas protectoras
- Carteles con fotos de pulverizadoras nuevas y antiguas

• **Notas**

- *Las Mejores Prácticas para el Manejo de Azufre en los Viñedos para Vino* (Alianza de Control de Plagas en Uvas para Vino de California)
- *Azufre La Mejor Forma de Aplicar* (Coalición Urbana/Rural para la protección del medio ambiente).
- Etiqueta y Hoja de Datos de Seguridad sobre Materiales (MSDS en inglés) de azufre en polvo.
- Fotos de pegotines de seguridad para la pulverizadora.
- Fotos de cosas a evitar; por ejemplo no poner la mano en una tolva que carece de protección.

Programa Educativo

1. Introducción (2 minutos)

Preséntese e infórmeles a los participantes los objetivos de aprendizaje:

- Comprender porque es tan importante el tema de la deriva de azufre.
- Identificar las áreas sensibles al azufre en polvo, y las maneras de evitar la deriva de azufre y las quejas del público.
- Repasar el uso y la aplicación segura de azufre en polvo y el manejo seguro de pulverizadoras.

Explique que la estructura de esta sesión es diferente al resto. Se va a cubrir varios aspectos del uso y la seguridad de azufre en polvo – buenas prácticas, equipo de protección personal (PPE en inglés), riesgos para los humanos y el medio ambiente, carga y aplicación.

2. La deriva de azufre en polvo es un tema importante (5 minutos)

Discusión – de Incidentes de Deriva de Azufre: Muestre el cartel con los gráficos del folleto “*Las Mejores Prácticas para el Manejo de Azufre en los Viñedos para vino*”. Explique a los estudiantes que esta información fue obtenida de incidentes de deriva en California durante 1997 a 1999. Pregunte cuales son los puntos importantes:

- La mayoría de los incidentes de deriva de azufre son debido a aplicaciones hechas a los viñedos.
- Los incidentes de deriva de azufre ocurren en toda California (es un problema Estatal).

Recalque que los incidentes de deriva de azufre han aumentado y que el 80% son debido al azufre en polvo. Pregunte ¿porqué han aumentado los incidentes y porqué tantos son debido al azufre en polvo?

1. Hay menos distancia entre los viñedos y las zonas urbanas, lo cual causa más quejas de deriva.
2. El uso de azufre es barato y efectivo por lo cual es el fungicida más ampliamente usado en los viñedos (controla la cenicienta polvoriento o mildiu, una de las plagas más importantes en la uva).
3. El azufre en polvo es fácilmente visible y se mueve fácilmente en la corriente de aire.

Recalque que la deriva de azufre en polvo es la queja No. 1 en cuanto se refiere a insecticidas y que se debe reducir estos incidentes. Sino, los productos hechos con azufre (especialmente el azufre en polvo) van a ser reglamentados más estrictamente o van a ser prohibidos.

3. Maneras de minimizar la deriva de azufre y las quejas del público (20 minutos)

Discusión – Identificación de Áreas Sensibles: Acentúe que primero es importante identificar aquellas áreas en el campo donde los incidente de deriva pueden resultar en quejas hechas por el público. Es importante tener extremado cuidado en el manejo de azufre cerca de estas áreas. Pídale a los estudiantes que hagan una lista de las ‘áreas sensibles’ y que describan porque estas son áreas delicadas (debido a actividad humana).

♦Escuelas ♦Paradas de autobus ♦Caminos concurridos ♦Viviendas o edificios ocupados

Tome nota que las áreas sensibles al azufre también incluyen cultivos susceptibles y cursos de agua.

Discusión – Buenas Prácticas: Pregunte a los estudiantes cuales son algunos de los factores que pueden ser manejados para minimizar la deriva de azufre y las quejas del público. Discuta los siguientes 10 componentes del folleto “*Las Mejores Prácticas para el Manejo de Azufre en los Viñedos para Vino*”. Acentúe aquellos factores que los estudiantes pueden influenciar.

- **Ser un buen vecino.** Tomar conciencia de las inquietudes que tienen los vecinos y mejorar la comunicación y el entendimiento con ellos. Pregunte a los estudiantes que es lo que ellos harían si fueran enfrentados por un vecino enojado debido a la deriva de azufre (suspender la aplicación y llamar a su jefe).
- **Manejo del follaje.** Manejando y raleando el follaje correctamente se puede reducir la cantidad o el número de aplicaciones de fungicidas.
- **Monitorear el desarrollo del mildiú.** El uso del índice desarrollado para el mildiú ayuda a determinar cuando es el tiempo óptimo para la aplicación de un fungicida y puede reducir la frecuencia de las aplicaciones. (Explique que es el índice de Mildeu).
- **Establezca zonas de contención.** Establezca zonas de contención en las cuales no se fumiga para prevenir la deriva de azufre hacia áreas sensibles.
- **Manejo de áreas extremadamente sensible.** Considere aplicar azufre mojable en esta situación.
- **Dosis selectivas.** Use la dosis efectiva más baja dependiendo del crecimiento de la viña.
- **Mantenimiento del equipo.** Mantenga y calibre el equipo para aplicar la dosis estipulada con precisión y en silencio. Si es posible, apague la pulverizadora al final del surco.
- **Monitoreo de las condiciones meteorológicas.** Monitoree las condiciones climáticas antes y durante la aplicación,. No aplique azufre en polvo cuando el viento excede 10 millas por hora, a su vez el viento mínimo recomendado para una aplicación son 2 millas por hora. Evite hacer una aplicación cuando el viento va en dirección hacia áreas delicadas.
- **Período de aplicación.** Disminuya la visibilidad al público haciendo la aplicación durante la noche o en periodos de menor actividad humana.
- **Manejo de resistencia.** Considere la rotación con otros fungicidas.

Ejercicio para resolver problemas: Muestre a los estudiantes un diagrama de un viñedo con áreas sensibles. Pregunte que es lo que ellos harían para minimizar derivas de azufre y quejas. Alternativamente, divida a los estudiantes en grupos, entregue a cada grupo un esquema y haga que el grupo discuta y presente estrategias. (ej. aplicaciones durante la noche, monitorear y tomar precauciones contra el viento, apagar el equipo al final del surco, no aplicar polvo a viñas cerca de áreas sensibles, y el uso de azufre mojable en vez de polvo).

Discuta maneras de medir la velocidad del viento. Muestre un medidor de viento. Indique quien es responsable de monitorear la velocidad del viento(quien aplica es responsable).

4. La etiqueta de azufre en polvo para la seguridad del trabajador y el medio ambiente (10 minutos)

Acentúe que la etiqueta es el documento legal que contiene la información de seguridad y uso. En esta sección pídale a los estudiantes que busquen la información apropiada en la etiqueta.

Discusión – Palabras de Señal y Equipo de Protección Personal: Pídale a los estudiantes que identifiquen las palabras de señal y su significado. (“Caution” o precaución: levemente tóxico o relativamente no tóxico). Luego, pida a los estudiantes que determinen cual es el equipo de protección personal requerido para quienes manejan y aplican azufre.

- Camisas de mangas largas
- Pantalones largos
- Guantes impermeables
- Zapatos y medias
- Protección para los ojos; gafas o anteojeras con protección sobre las cejas y los costados.

Discusión – Riesgos a los seres humanos y animales: Pregunte sobre estos riesgos:

- Causa moderada irritación en los ojos, piel y garganta
- Puede causar problemas de respiración.
- Puede ser nocivo si es absorbido a través de la piel.

Acentúe la importancia de comenzar cada día de trabajo con la ropa y el equipo de protección personal limpio. Haga recordar que deben lavarse antes de comer, beber, fumar o usar el baño.

Discusión – Riesgos al Medio Ambiente: Pregunte si el azufre en polvo es un riesgo para el medio ambiente. (Aunque no es un gran riesgo para el medio ambiente, los derrames y fugas deben ser evitados).

Discusión – Peligros físicos: Pregúntele si el azufre suspendido en el aire puede causar riesgos. (Puede encenderse con facilidad - evite fuentes de calor, chispas o llamas. No fume durante la aplicación).

Discusión – Intervalo de entrada restringida: Pregúntele cual es el intervalo de entrada restringida para azufre en polvo. (No se puede entrar a una área tratada por 24 horas después de hecha la aplicación – esto aumenta a 3 días en el condado de San Joaquín, a partir del 15 de Mayo. Si es necesario entrar durante este intervalo se debe poner el equipo de protección personal apropiado).

Discusión – Precauciones a tomar durante la aplicación: Pregunte:

- ¿Porqué no se debe aplicar azufre después del medio día cuando las temperaturas son de más de 100°F? (A altas temperaturas el azufre puede quemar el follaje y la fruta. Además, el azufre en polvo es combustible –puede encender tractores, tolva, viñas).
- ¿Porqué no se debe aplicar azufre por dos semanas antes o después de una aplicación de aceite (se quema el follaje/fruta)?
- ¿Cuales son algunos cultivos sensibles al azufre y que precauciones se deben tomar cuando se hace una aplicación en su cercanía (las mismas que en otras áreas sensibles)?

Discusión – Almacenaje y deshecho: Pregunte a los estudiantes donde y cuando se deben desechar las bolsas de azufre en polvo.

- Las bolsas vacías se pueden quemar en el lugar de la aplicación. Las reglamentaciones del condado de San Joaquín requieren que las bolsas vacías sean quemadas el día que fueron usadas. EVITE el humo – es tóxico.
- Las bolsas vacías pueden ser llevadas a lugares de despojo autorizados.
- Almacene el azufre en polvo solamente en el envase original y manténgalo sellado. Almacene el azufre en una área cerrada bajo llave.

5. Seguridad del trabajador – Pulverizadoras (5 minutos)

Discusión – Manejo seguro del equipo para la aplicación de azufre en polvo: Muestre las fotos de pulverizadora antiguas (modelos de tres puntos) y pulverizadoras nuevas (modelo de remolque). Pídale a los estudiantes que discutan aspectos importantes de seguridad. La discusión puede incluir:

- Escudos protectores apropiados y no apropiados para las correas, ventiladores y el eje de mezclar (batidor).
- La importancia de las calcomanías (pegotines) que tratan de la seguridad (indique las 5 calcomanías que tienen los modelos nuevos).
- Como remover apropiadamente una bolsa atrapada en el batidor (compare con la foto – deben usar guantes de goma y el batidor debe estar apagado).
- La importancia de apagar el motor del tractor y asegurarse de que todo movimiento cese antes de dejar el tractor para ajustar, lubricar o desenganchar la pulverizadora.
- ¿Porqué las manos y todo tipo de ropa suelta deben permanecer fuera del alcance de cualquier parte motorizada de la máquina? ☹
- ¿Porqué todos los protectores tienen que estar en buenas condiciones y firmemente en su lugar?
- Mencione la ventaja que tienen las pulverizadoras nuevas al tener escalones al costado (se efectúa la carga con más facilidad y mayor seguridad).
- Donde se deben parar cuando cargan el azufre (al costado con el viento en dirección opuesta).
- La ventaja de tener una caja de almacenamiento en la parte delantera de las nuevas pulverizadoras (puede guardar bolsas de azufre extras)
- La ventaja de poder apagar el flujo de azufre cuando esta manejando el tractor (muestre la palanca de distribución en los modelos nuevos).
- Suspender la aplicación si el conductor está demasiado cansado o si no tiene adecuada visibilidad.
- Use sentido común cuando maneje una pulverizadora y consulte el manual del equipo.

6. Conclusiones y finalización (3 minutos)

Recuerde a los estudiantes sobre el manejo cuidadoso de azufre para prevenir problemas de deriva. Pregunte si tienen alguna pregunta sobre las buenas prácticas para el uso de azufre o la seguridad del trabajador. Para concluir, recalque que cada persona puede hacer la diferencia si usa el azufre con cuidado.

Traducido por Lucia G. Varela, **Universidad de California**

Practical Neighbor and Community Relations

Often most neighbor-vineyard problems arise from lack of knowledge about what is occurring in the vineyard. Meeting with your neighbors can help alleviate problems in the future.

1. **Communication.** Make sure neighbors know how to contact you. Pass out business cards to neighbors, post your telephone number at vineyard entrance.
2. **Information.** People want to know what, how, why and when things are happening in the vineyard. They are usually concerned about perceived health risks from pesticide drift, and the inconvenience from dust and noise.

People appreciate it if you explain some of the reasoning behind your pesticide decision-making. Before you meet with neighbors at their house or in the field, know the answers to the following types of questions for the pesticides you are using. Neighbors appreciate knowing there is reasoning behind your pesticide usage.

Here's a sample scenario for an application of sulfur dust to prevent powdery mildew.

	Question	Answer
What?	Is being applied?	Sulfur dust. Sulfur is approved for use on organic vineyards.
Why?	Is it applied?	Sulfur helps prevent powdery mildew on the grapes.
How?	Will it be applied?	It is applied with a dusting machine pulled behind the tractor. We have bought a special machine that can be turned off as the tractor drives around the vine rows.
When?	Will it be applied?	The first application is usually in April, and will occur every 10-14 days through June. A powdery mildew index based upon the weather is used to determine scheduling. The dusting occurs at night because the wind is less likely to be blowing.

Here's a sample scenario for an application of Provado to reduce sharpshooters.

	Question	Answer
What?	Is being applied?	Provado, at less than 1 oz per acre.
Why?	Is it applied?	We monitored sharpshooter counts with the yellow sticky traps you see. When they start flying in the spring, we spray Provado to prevent them from spreading Pierce's Disease.
How?	Will it be applied?	It is applied with an electrostatic spray machine. The machine charges the particles, so they spray adheres better to the leaves of the grapevine.
When?	Will it be applied?	The first application is in the spring, with another possible in July. It is usually applied in the early morning.

Let neighbors know plans can change according to weather. If it is too windy, an application may be delayed. Rain and heat can also change schedules.

Outreach

Introduce yourself to new neighbors as they move in. If there are many neighbors surrounding your property you may wish to invite them out to the field.

Field Day Suggestions

1. Give a personal invitation to closest neighbors, hand them a flyer yourself.
2. Invite community leaders, including teachers, supervisors, and council members.
3. Post flyers at local stores.
4. Inform newspapers of your meeting.
5. Invite someone from the Ag Commissioners office. They can help talk to the neighbors if you would like.
6. Offer an incentive. Food or wine made from your vineyard works great.
7. Hand out business cards at your meeting.
8. Review pesticide practices, and the seasonal nature of vineyard work.
9. Have neighbors meet your field manager and some workers.
10. Be kid friendly, have some tractors and equipment for kids to look at.

Follow Up

1. **Respond.** If someone calls with a complaint, make sure to return that phone call within a day. Often, people just want to hear an apology if you happened to make a mistake.
2. **Accommodate simple requests.** Try to work on a compromise if a neighbor has a reasonable request. Maybe you can start dusting their side of the field first during the late evening. You may wish to notify neighbors when sulfur dusting will occur. Don't make promises you can't keep. If you can't meet a request, just let the neighbor know it is not possible.
3. **Lower noise levels.** Often people are more disturbed by noise than the actual spraying.
 - a. Limit the number of tractors in one field at a time.
 - b. Test new equipment for noise levels before you buy it.
 - c. Keep equipment running properly.
 - d. Have employees park cars away from houses and talk quietly during nights.
 - e. Fill equipment tanks away from neighborhoods.

Benefits

1. You will be called first, instead of a complaint to the Ag Commissioner or police department.
2. Neighbors will watch out for your vineyard. If a pipe breaks they will often call to let you know.
3. People are generally proud to live next to a vineyard. They will often buy and serve guests wine that came from your vineyard.
4. Cooperation might improve with the neighbors. They may consult you for Pierce's Disease resistant plants to put in their yard. You might let them use your vineyard access to assist in backyard landscaping projects.

CCVT Focus on Sulfur
By Kris O'Connor and Joe Browde
Wines & Vines Magazine – October 2001

Growers and Community Members Benefit from Outreach Effort

More than 200 people attended the Central Coast Vineyard Team's (CCVT) sulfur management educational meetings in February, representing over 25,000 acres of winegrapes on the Central Coast. Each of the host growers had experience with farming around sensitive areas – i.e. schools, residential, roads, bus stops – and they represented outstanding examples of proactive farming around non-agricultural areas. Although too early to demonstrate practices in the vineyard, the goal of the program was to heighten awareness for the upcoming season.

In addition, a productive dialogue between growers and community members occurred at the Santa Ynez meeting. Representatives from the Department of Pesticide Regulation and the Agricultural Commissioner's office provided additional information to growers and community members.

Why Address Sulfur Dust?

CCVT's Kris O'Connor opened each meeting by emphasizing the collaboration between CCVT and the California Winegrape Pest Management Alliance (PMA) in promoting reduced-risk practices for pest management in winegrapes. Despite no reported incidents of sulfur drift in Monterey County during 1997 to 1999, she stressed that growers still must implement strategies that minimize the potential for incidents. In fact, future incidents here or elsewhere in the state could result in widespread regulations related to sulfur products and/or uses.

Joe Browde, PMA project coordinator, provided background on the PMA and discussed how these educational efforts targeting sustainable vineyard practices complement each other. PMA must be the communication link for reduced-risk strategies and tactics to growers within and across winegrape regions. Also, PMA is incorporating an element of public education, ensuring awareness of grower efforts towards reducing pesticide risks and strengthening community relationships. He summarized past sulfur drift incidents, citing that a majority were public complaints involving dusting sulfur applications to grapes. The status of the Sulfur Task Force (STF) and its outreach program were discussed. Browde stressed the collaboration between the sulfur industry and winegrape growers in efforts to reduce sulfur drift incidents. The PMA approach differs from STF by relying on grower-to-grower education, based on "individual farm" case studies for managing sulfur applications near sensitive areas.

Monterey County Grower Shares Experience

The host grower for this meeting, Roger Moitoso, reviewed the sulfur management practices used at Arroyo Seco Vineyards. Despite farming next to sensitive areas (roadways, parks and schools), he effectively applies sulfur dust without public complaint. A carefully prepared plan for the timing and sequence of applications is key. More importantly, all dusting typically occurs at night, greatly limiting public visibility to activities and minimizing issues concerning wind. Winds are monitored to ensure that dust movement is away from sensitive

areas and into the vineyards, and rows closest to sensitive areas are treated first, beginning around 10 p.m., which minimizes “noise” complaints from nearby residents. Any applications that must continue after daybreak are confined to interior portions of vineyards.

Moitoso stressed the importance of good communication and training to ensure applicators use pesticides responsibly and safely. It is crucial that applicators understand and follow the plan for dusting sulfur application and adjust activities according to weather conditions or sudden changes in nearby human activity.

Other meeting attendees – owners, managers, and operators – discussed sulfur practices for vineyards near sensitive areas. Some believe that more expensive applications of wettable sulfur should be used for entire vineyards or specific rows near extremely sensitive areas to further minimize the potential for drift. Since most wineries prohibit applications of wettable sulfur beginning at bloom, alternative reduced-risk sprays should be used thereafter. It was noted that use of low-volume electrostatic sprayers further reduces drift potential. Attendees also shared their experiences with operator training and reward systems.

Reducing Sulfur Risk at Royal Oaks Vineyard in Santa Ynez

Royal Oaks Vineyard, managed by CCVT board member Craig Macmillan, is a high profile site, with residential neighbors located nearby. The vineyard is visible from main roads on three sides. For these reasons, Macmillan takes extra care in making sure neighbors are informed and that his employees take necessary safety precautions.

Reducing Drift and Sulfur Risk:

- Macmillan maintains his spray rig well to get good coverage and no over-spray.
- An adjuvant is commonly used as a sticker/spreader.
- The sprayers are adjusted so nozzles are only at canopy height.
- Sprayers are calibrated and adjusted for every application.
- Macmillan’s goal is to reduce the amount of material used overall.
- At bud break, wettable sulfur with copper hydroxide is applied using a spray gun.
- The spray gun allows for a precise application and less material/acre.
- Leaf pulling and shoot thinning are done when canes are about 12 inches and can snap out easily.
- Leaf pulling and shoot thinning help to get the chemical into the fruit zone, which makes applications more effective.
- Last year, Macmillan rotated his spray schedule with sulfur and Abound.
- The Abound allowed him to go 21 days between spraying, which significantly reduced the amount of time in the vineyard.
- Macmillan’s vineyard has a tall stand of poplar trees between the residential area, which act as a screen.
- The poplars are full and green during the growing season.
- Residential areas are very close, so spraying must be done early in the morning because of noise.
- Spraying begins in the vineyard middle at 5:30 or 6 a.m. and continues to the outer edges.

- Outer edges are sprayed when rush-hour traffic subsides.
- The outer three rows are sprayed with a one-direction sprayer away from the road.
- Macmillan knows that the wind in Santa Ynez can start as early as 10 a.m., so he stops spraying well before this time.
- Macmillan has at least two training sessions a year for his operators/applicators.
- He teaches his employees how sulfur is used, why sulfur is used, and they are taught to adjust the spray rig to be as precise as possible so the least amount of material is applied.
- Macmillan believes that spraying is similar to pruning in that if employees understand what they are trying to achieve then they feel they have a role in improving things and do a better job.
- Macmillan keeps in touch with the immediate neighbors to keep them informed about the developing winery and chemicals that are used; and he coordinates spraying away from a nearby bus stop, in case children are present.

The California Winegrape Pest Management Alliance

By Joe Browde, Project Coordinator

2002 Proceedings of the CWSS

The California Winegrape Pest Management Alliance (PMA) is a grower-driven collaboration with the Department of Pesticide Regulation (DPR) to promote reduced-risk pest management. The California Association of Winegrape Growers (CAWG) provides organizational leadership and a steering committee, comprised of representatives from regional and statewide winegrape organizations, guides efforts. Technical advisors include members of UC Cooperative Extension, UC Sustainable Agriculture Research and Education Program, US EPA, and USDA-ARS. Funding is provided by grants from DPR.

Inception

PMA was formed in August 1999. A number of ongoing events reflected increased concerns with pesticides and threatened uses – implementation of the Food Quality Protection Act (FQPA), increases in agricultural-urban interfaces, detections and increased awareness of groundwater contamination and other off-target movement, and raised awareness of worker exposure. The winegrape industry realized these concerns and founded PMA as a mechanism to increase adoption of reduced-risk practices, providing win-win solutions for growers, communities, and the environment. The creation and purpose of PMA is directly aligned with “Wine Vision”, a strategic plan of the wine and winegrape community to be leaders in sustainable practices – environmentally sound, socially responsible, economically viable.

For winegrapes, PMA is unique in providing a strong, unified network for communicating pest management information to growers across California. A number of regional organizations have grower-led programs for promoting sustainable farming practices. These include the Lodi-Woodbridge Biologically Integrated Farming System, the Central Coast Vineyard Team Positive Points System, the Napa Sustainable Winegrowing Group, and the Sonoma County Grape Growers Association Integrated Pest Management Program. PMA complements and expands regional efforts by supplying more extensive and updated information sourced from growers across the state.

Focus

PMA has the statewide mission to promote pest management practices that minimize the potential for environmental and human harm while maintaining the economic viability of production. The Alliance advocates that improved relations between winegrowers and their neighbors and communities are fundamental to sustainable agriculture. Therefore, one goal is to further educate the public about the logic for vineyard operations and that growers care and act to reduce pesticide risks and strengthen community relationships.

But, growers must do their part by continuing to adopt practices that minimize risks from pesticides. A key goal of PMA is to educate growers about how to reduce drift incidents for sulfur and limit uses of higher-risk herbicides. Sulfur and herbicides are important tools for pest management in winegrapes across the state. However, uses are being carefully scrutinized by regulatory authorities and could be subject to further regulation. It is important to maintain the safe, effective uses of sulfur and herbicides, as well as those for other pest management tools.

The issue with sulfur is clear. Reports of drift have increased in recent years. In fact, a survey conducted by DPR found 86 reported incidents of sulfur drift from 1997 to June 1999. Approximately two thirds of these reports were attributed to applications on grapes, distributed across the state. Over 80% of reports for grapes involved dusting sulfur. The key factor for the increase in incidents seems to be an increase in agricultural/urban interfaces, leading to more public complaints.

There also are statewide concerns about effects of herbicides on the environment and human health. Herbicides used in grape production have been detected in groundwater in some areas. Further, many herbicides registered for grapes are considered higher-risk materials in terms of human health. Consequently, a number of herbicides and uses may be unavailable for the future. This is troubling since only one (Roundup, glyphosate) of the eight most commonly used herbicides on winegrapes is considered a lower-risk material. PMA intends to reduce uses of herbicides classified as potential contaminants of groundwater or FQPA high-risk (priority I) materials.

Actions

PMA is using field demonstration and outreach to communicate reduced-risk approaches for managing sulfur and weeds. Key to success is effective grower-to-grower transfer of practical information. Accordingly, 34 grower-cooperators have been recruited over five winegrowing regions – North Coast, Central Coast, South Coast, Northern Interior, and South Central Valley. Cooperators implement and record reduced-risk management practices for sulfur and weeds, which they share and showcase at field days for winegrowers and the public.

Sulfur cooperators have a history of farming near areas sensitive to sulfur (e.g., residences, school zones, busy roadways). These growers successfully integrate sulfur into management programs for powdery mildew without complaints of drift. Dusting sulfur must be managed with particular care because of its extensive use, visibility, and susceptibility to offsite movement by wind. Programs incorporate elements of neighbor relations, canopy management, mildew monitoring, buffer establishment, alternative fungicides, equipment operation, weather monitoring, and application timing.

PMA cooperators demonstrating weed management have been recruited based on their history of managing weeds using reduced-risk strategies and tactics. Pest management is a continuum from higher to lower risk. Ideally, pesticides categorized as higher risk are avoided. However, in the absence of reasonable options, PMA acknowledges that certain circumstances warrant uses of these materials. To optimize decisions for weed management, growers should have detailed understandings of weed species, soils, effectiveness of alternatives, and/or economic considerations specific to each vineyard. Growers that tolerate sub-economic populations of weeds are progressing fastest along the continuum to more reduced-risk weed management. PMA cooperators restrict uses of higher-risk herbicides to situations where *alternative tactics provide unacceptable efficacy or are economically impractical.*

Cooperators incorporate various reduced-risk options into under-the-vine programs for managing weeds. Nonchemical tactics include mechanical options (e.g., cultivating, mowing, hand hoeing), preventive interference (e.g., mulching, composting, cover cropping), heat (e.g., flaming, steaming), and drip irrigation (e.g., subsurface). In addition to efficient water use, drip irrigation can markedly limit weed pressure both spatially and temporally, and needs for supplemental control.

Those cooperators that include herbicides in their reduced-risk programs often rely on lower-risk, post-emergent materials such as glyphosate (Roundup). Where higher-risk preemergent or postemergent herbicides are warranted, uses can be minimized and risks reduced by accurate calibration and by using lowest effective rates, decreased spray swaths, and optimal application timings. Spot spraying via infrared technology or by hand or use of controlled-droplet applicators can minimize uses of post-emergent herbicides and associated costs.

Expected Achievements and Future Goals

Through expanded winegrower education, PMA intends to reduce or eliminate complaints of sulfur drift and decrease uses of higher-risk herbicides. Cooperators will continue to be added. Evolving practices for managing sulfur and weeds will be integrated into future demonstration and outreach activities. Over time, PMA will incorporate reduced-risk practices for managing other pests. An ultimate goal is to implement a statewide, grower self-assessment program for managing all vineyard pests.

Efforts to increase public understandings about real challenges faced by winegrowers and their commitment to making judicious choices will continue. The simultaneous education of growers and the public will lead to mutual understandings, improved farmer-community relationships, fewer pesticide incidents, and more sustainable farming systems.

For California's winegrowers, PMA is the latest and broadest effort at promoting sustainable viticulture through a cooperative effort of demonstration and outreach. Agriculture must be proactive in addressing and resolving challenges, such as risks from sulfur and herbicides, thereby helping direct and shape its own future. Through PMA, the winegrape community substantiates its lead role in sustainable agriculture by balancing the production of high quality winegrapes with high standards for environmental quality and human health.

Herbicides Added to CAWG Program

By Dan Bryant

Western Farm Press – February 2, 2002

The California Association of Winegrape Growers' effort to abate sulfur drift has added promotion of more judicious use of high-risk herbicides to its proactive effort to knit understanding between growers and the public.

Joseph A. Browde, project coordinator for CAWG's Pest Management Alliance (PMA), explained how it is being done in a talk at the recent conference in San Jose of the California Weed Science Society.

Established in 2000, PMA is a partnership between wine grape growers and the California Department of Pesticide Regulation.

Its management group comes from the ranks of growers, university cooperative extension specialists, USDA, EPA, and others. It is funded by about \$200,000 in grants from DPR, growers, and wineries. More than half of the PMA's activities are supported by voluntary, in-kind contributions.

Browde said the alliance came about as a result of wine grape growers increasing awareness of pesticide concerns that could threaten their business. He said it is committed to a sound, proactive approach to help sustain the industry.

Implementation of the Food Quality Protection Act, the increasing interface between agriculture and urbanization throughout the state, increased understanding of off-target movement of pesticides, and heightened concerns with worker exposure all brought about the public's mounting awareness.

'Prepare for future'

"Growers realized they'd better get their act together and prepare for the future," Browde said. The thrust was to consider the wine grape industry, the general public, and the environment, simultaneously.

Tied in philosophy to several efforts, including the new Sustainable Winegrowing Practices, PMA fosters adoption of integrated pest management systems with various wine grape grower groups.

PMA is grower-driven and has a polished mission statement. "There have been reports of high-profile drift when it comes to sulfur dust across the state. We also want to minimize herbicide use that can influence water quality or are currently listed high on the priority list of FQPA," Browde said.

Educating the general public in such matters is crucial to the sustainability of agriculture, he said. Sulfur became an issue as it emerged during 1997 to 1999 in 86 reports of sulfur drift handled by county agriculture commissioners throughout the state. Sixty-six of those reports pertained to grapes, and most of them were public complaints at the urban-ag interface.

A sulfur task force was formed in 1999 with registrants, who developed a supplemental label and a stewardship program for all sulfur products.

PMA is collaborating with the sulfur task force and specializes in the public education outreach to sensitive areas, those of human activity, he said.

Challenges

“The public has to realize the challenges of grape growing and pest management. We want the public to realize there are worst alternatives than sulfur. We believe if we get that part right, we can decrease the public complaints.”

Browde said PMA is not out to eliminate products. “We just want to keep everything around so that uses are warranted and things are done most safely. Reduced risk practices are available and we want to get the word out to growers around the state.”

In its campaign relating to herbicides, PMA seeks to minimize risks from herbicides, which would include limiting use of “problematic” herbicides used in vineyards. Among those are several compounds under scrutiny for water quality or FQPA issues. Of them, only Roundup is listed as a lower risk material.

“Wine growers are concerned because not a lot is left off these lists. So, again, we are not saying not to use something but we are about keeping something in our arsenal where warranted.”

PMA surveyed grape growers across to state to learn what they consider lower risk practices. Principles included are good, scientific information on soils and weed species, the amount of weeds that are economic and can be left in the field, and the elements of reduced risk.

Among the reduced-risk practice alternatives for weed control are the venerable French plow and other machinery, mowing or mulching, heating or flaming, and use of subsurface drip irrigation.

Among practices for reduced chemical use are lower rates per acre either by swath width under vines, calibration adjustments, closer timing to target susceptibilities, and rotation with higher-risk materials.

We want growers to become alert to what’s going on in their fields. They won’t have to use these every year, but maybe every second or fourth year.”

The alliance has been using field demonstrations, presented by growers, to get the word out to other growers at various sites up and down the state. All along, the group seeks to have “a rational dialog” with the public about these practices.

Browde said PMA has attracted support of major wineries, such as Kendall-Jackson, E & J Gallo, Mondavi, and Canandaigua, to “buy-in” with the effort and support.

Moving plans for the coming season, he said PMA is adding growers to showcase their reduced-risk vineyard practices and expand the educational base.

Growers and PCAs have been approached for input, the next step is Spanish-language presentations for workers, and a third element is heightened information to the public.

“The future is full of change – it always will be,” Browde concluded. “We want to make sure our growers know the options. Proactivity is the key, so we will continue to try to anticipate change, to be there to try to come up with solutions. If you are there, being proactive vs. reactive, you can be part of the change.”

Catching the Drift

Winegrape growers work to prevent sulfur dust from moving outside the vineyard and into adjacent sensitive areas

By David Oltman

California Farmer – June 2002

An effort by winegrape growers to keep sulfur dust from drifting off site might be viewed as a “good neighbor” policy since one of its main goals is to be aware of any potential concerns by those living close to their vineyards.

An ongoing stewardship program is designed to reduce the potential for sulfur drift. It provides growers with best management practices that allow them to maintain good relations with their neighbors while continuing their ability to use an effective and economical pest-management tool. Dusting sulfur is the primary material used to combat powdery mildew, a serious grape pest throughout the state.

“We are trying to make sure that growers use sulfur responsibly and prevent drift, especially to surrounding sensitive areas,” says Joseph Browde, project manager for the California Winegrape Pest Management Alliance (CWPMA). “By doing this, we can decrease the number of complaints about sulfur drift and sustain the use of this valuable compound over time.”

That message was brought home to growers and their employees during a recent sulfur stewardship field day sponsored by the Lodi-Woodbridge Winegrape Commission at a vineyard near Lockeford in San Joaquin County. The 95-acre Cabernet Sauvignon vineyard was chosen, in part, for the field day because of its proximity to the Lockeford School.

The effort to curtail drifting sulfur incidents is a result of a survey by the California Department of Pesticide Regulation conducted over a three-year period -- 1997-1999. That survey revealed 86 incidents of sulfur drift, two-thirds of those being from use in grapes. In addition, 80% of the drift complaints for grapes were attributed to dusting sulfur.

As a result of those findings, the California Sulfur Task Force, a consortium of sulfur manufacturers and dealers, was created to look into ways to lower the incidents of drift from agricultural operations. The CWPMA, as a grower-led partnership, is working closely with the Sulfur Task Force in an outreach program to minimize the potential for sulfur drift.

The effort that the CWPMA is undertaking to mitigate sulfur drift is being done in conjunction with the state DPR as part of an overall program to promote reduced-risk pest management in winegrapes. The program is targeting growers, vineyard employees (both Spanish and English speaking) and the general public.

“We use dusting sulfur because it is cheap and it works extremely well in combating powdery mildew,” Browde told those attending the Lockeford field day. “However, that combination of high use, its visibility and its susceptibility to drift can create a problem with your neighbors.”

POTENTIAL IRRITANT

Growers should recognize that although sulfur is a low-toxicity material, it is a potential irritant when it enters people’s eyes, throats and lungs, Browde says. “We have to realize that some of these people who report drift incidents do have a rational reason to complain.”

As a result, the goal for all grape growers should be to keep sulfur dust in their vineyard and away from any areas where it could be a potential problem, Browde says. “Although we realize it is virtually impossible to decrease absolutely all drift with sulfur dust, we sure can do a good job to lower incidents with smart management practices.”

A list of 10 best management practices for using sulfur in winegrapes has been developed by the CWPMA to reduce the potential for drift out of the vineyard. “These are 10 elements that growers can incorporate into specific programs they have developed for their vineyards,” Browde says.

At the top of the best management practices list is “be a good neighbor.” This is considered a primary consideration for grape growers in many areas of the state where vineyards are coming under increased pressure from residential and commercial development, Browde says.

“Being a good neighbor is so important because it really sets the stage for overcoming any complaint scenario that may occur because of sulfur use,” Browde says. “If you have a good relationship with your neighbor, you generally are able to work things out prior to them reaching the legal arena.”

Joe Valente, who manages the Kautz Farms vineyard where the field day was held, says he is very aware that he is applying sulfur adjacent to the nearby Lockeford School and takes care to avoid any drift that could affect the children there.

“We sulfur on Saturday and the main reason for that is because there are no kids in school at that time, Valente says. “You have to live with what you have in the area in which you are farming and work around it.”

Valente says that during the spring he generally applies dusting sulfur at a seven-day interval, which allows him to do that work on Saturdays when school is not in session. That consideration for his neighbors carries over to other spray programs, including those to control weeds and any insect problems that may occur in the vineyard, he adds.

“We are talking about drift management for sulfur, but that really carries over to other pesticides,” Browde says. In addition to its outreach program to reduce drift from sulfur dust, his organization also provides growers with information on reduced risk weed management, he adds.

Cliff Ohmart, research/IPM director for the Lodi-Woodbridge Winegrape Commission, says the primary message for growers is that they need to use a “common sense” approach when applying sulfur to minimize drift. The 10 best management steps for sulfur application that were developed by the CWPMA emphasize such an approach, he adds.

“Those are pretty common sense things that most of the growers are already doing, but sometimes when people get in a hurry they try to cut corners,” Ohmart says. “We need to make sure that these concerns are in the front of their minds and when they think about cutting corners, they realize they shouldn’t.”

GAUGING CONCERN

The Lodi-Woodbridge district has begun its own outreach program in an effort to gauge community concern for such issues as sulfur dust drift, Ohmart says. A recent meeting with the Parent-Teacher Association of the Lockeford School and a meeting with community members in a local vineyard were designed to hear concerns and communicate some of the issues facing winegrape growers, he adds.

Ohmart says that minimizing sulfur dust drift is a very important issue for growers, since they want to head off any regulatory action that might jeopardize sulfur use. “We are very

committed to this project because of how important a compound it is for us – it's inexpensive, it's basically safe – and it would be scary to think about losing it.”

Those attending the field day were able to view four of the latest electrostatic and low-volume sprayer models designed to apply liquid sulfur to grape vines. Applying liquid sulfur, while more expensive than applying sulfur dust, is seen as one of the ways to minimize drift out of the vineyard.

Growers also shared their concerns about the continuing trend of urban encroachment on vineyards and how that affects their ability to farm.

“It's very important to be concerned about your neighbors but you also have to be able to manage your crop,” says Mike Harder, a vineyard manager for Vino Farms who oversees some 2,000 acres of grapes in the Clarksburg area along the Sacramento River Delta. Harder has developed a unique method of alerting his neighbors about his sulfuring activities.

“I mark their mailboxes with a blue marking tape during the day and that night we will apply our sulfur,” Harder says, adding that he uses about a 50-50 ratio of dust and liquid sulfur. “We dust at night because that seems to work better for everyone around here.”

The marking system is a follow-up to a letter that Harder sends to his neighbors in the spring, before sulfur applications commence, to alert them about this cultural activity. “I give it to them three or four weeks beforehand just to let them know to be on the lookout,” he adds.

So far, there have been no complaints about sulfur drift from any of his neighbors, Harder says. “You try to respect other people as you would want to be respected. The better perception you are going to give the public, the more benefits there will be, whether that is in increased wine sales or other ways,” he adds.

Richard Caldwell, who owns 15 acres of Chardonnay and Zinfandel vines in Acampo, says that although he is a small grower, he is still aware of potential problems with sulfur dust. “I have a short row that is along the road and even if I have to skip sulfuring that row, I will do that to keep sulfur from drifting into the road.”

Caldwell says his property is surrounded by vineyards, including a large tract of land owned by Gallo, so he does not yet have to worry too much about sulfur drifting into sensitive areas. However, encroaching development may change that, he adds.

“On the next road north of my property, they are starting three developments with eight lots each – that is a lot of people moving into an area that is not over a mile long,” Caldwell says.

Browde says that a growing ag-urban interface throughout California increases the challenges faced by winegrowers and makes efforts such as minimizing sulfur drift important to maintaining credibility with vineyard neighbors.

“We want to reduce incidents of sulfur drift and improve relationships between winegrowers and the general public,” Browde says. “If growers work more closely with their neighbors and let them know about some of the basics of farming, and that they care and act to use safe practices, it can make a huge difference in keeping things sustainable over time.”

Best Management Practices for Applying Sulfur Dust

The CWPMA's has developed these 10 best management practices for growers to consider when applying sulfur dust:

- **Be a good neighbor.** Be aware of the concerns of neighbors and local communities.
- **Canopy management.** Use a trellis system and canopy thinning techniques that reduce the risk of outbreaks of powdery mildew and other diseases in the vineyard.

■ **Monitor mildew development.** Use a University of California powdery mildew index as a tool for optimally timing fungicide applications.

■ **Establish buffers.** Make sure that reasonable buffers exist around vineyards to prevent drift into sensitive areas.

■ **Deal with extra sensitive areas.** Consider the application of wettable sulfur or other low-risk fungicide sprays in vineyards located near sensitive areas.

■ **Select proper rates.** Adjust rates of sulfur or other fungicides to the lowest effective rate according to vine growth and development.

■ **Properly maintain and operate equipment.** Maintain, calibrate and select application equipment to deliver the intended rate as accurately and quietly as possible. Reduce RPMs or shut off dusting equipment at row ends.

■ **Monitor weather.** Monitor weather conditions before and during applications. Avoid applications of sulfur dust when winds exceed 10 mph or are blowing towards sensitive areas.

■ **Time applications.** Decrease public visibility and the potential for complaints by making applications during periods of least human activity (i.e., at night, weekends). For nighttime applications, minimize noise complaints by treating rows closest to residential areas first.

■ **Manage for resistance.** Consider rotations with other fungicides as a preventive measure against resistance to sulfur (although resistance to sulfur has never been found)

Winegrape PMA Field Day Goes Deep

By Nancy Gutierrez

Grape Grower Magazine – June 2002

A rainy April morning didn't stop growers and PCA's from attending the Winegrape Pest Management Alliance Seminar and Field Day at California State University, Fresno. Attendants stood in the rain patiently listening to representatives from various companies discuss the latest in air delivery sprayers that cut down and eliminate off-site drift.

The field day began with presentations by several farm advisors and industry professionals. Much of the focus was on sustainability and cost-cutting procedures. Joe Browde, Project Coordinator for the Winegrape Pest Management Alliance, welcomed the group before starting his presentation on the WPMA and sulfur stewardship.

Sulfur is commonly used for the control of Powdery Mildew in Vineyards because of its effectiveness and its low cost. Another commonality in sulfur usage is the complaint of sulfur drift. Browde discussed the issue of sulfur drift management.

I am not here to tell you not to use sulfur applications – but to use them *smartly* and restrict uses to needed applications,” Browde said. “Sixty-six percent of all incidents involving sulfur drift occurred in vineyards.”

The key issue is public complaint of drift; a reduction of drift incidents would be in the growers' favor. The Pest Management Alliance and the Sulfur Task Force have joined forces in the fight to educate the public on the use of sulfur as well as educate winegrowers about sulfur drift management.

Growers are urged to look beyond just the application of the sulfur and look at the larger picture. Recommendations include applying it at times when minimum activity is occurring and when weather conditions are favorable. Growers should also consider the concerns of neighbors and local school districts before application.

The job of the WPMA is to promote reduced-risk pest management through grower-driven demonstrations and outreach. Browde said the sulfur challenge is to reduced drift incidence or face the consequences, which potentially include mandatory user certification requirements.

Powdery Mildew Discussed

George Leavitt, UCCE Farm Advisor for Madera County, talked about the Powdery Mildew model and resistance management.

“I believe the Powdery Mildew disease index is the most important thing to understand, so that you can know what Powdery Mildew is doing in your vineyards,” said Leavitt. “By keeping track of what mildew is doing you'll know when to spray and what to spray.”

The Powdery Mildew disease index gives growers a time frame for the probable start of mildew in their vineyard. Temperatures must reach 70 F to 85 F for six continuous hours in three consecutive days before starting a count for the index. Once the specified degree-days have occurred, a grower can calculate the growth rate of powdery mildew and create an appropriate spraying schedule.

Leavitt also discussed resistance management in sulfur. As long as sulfur has been applied in the fields there has never been a detectable resistance to it by powdery mildew. However, Leavitt, as well as other farm advisors, does not believe that growers should *not* practice resistance management. “I believe that if we use all of the chemistry that we have now,

30 years from now our children will still be using those materials,” said Leavitt. “We need to use different materials with different modes of action.”

Efficiently utilizing fungicides with different modes of action increases their staying power as effective agents against powdery mildew and decrease the need for newer fungicides to replace those that no longer affect mildew. Leavitt suggests using a sulfur for one application then using a contact agent or eradicant, which smothers the fungus, like Erase or Trilogy. He also suggested using strobilurines which inhibit fungal respiration or systemic agents which “warn” the plant of an imminent attack.

The Urban Edge

Discussing the dynamics of farming along the urban edge was Doug Edwards, Deputy Agriculture Commissioner for Fresno County. Though there are many problems involving growers and neighbor relations, including development and changing public expectations, the most important problem involves county regulations and a grower’s knowledge of his rights as well as his neighbor’s rights.

“The Fresno Right to Farm ordinance encourages and protects the development of ag land,” said Edwards. “It says the redevelopment of property in or near a farm should be prepared to accept inconveniences if the farm was there first. The farm cannot be declared a nuisance.”

However, the limitations of this ordinance make it ineffective if the redeveloped land in question is not a subdivision. The ordinance doesn’t apply to cities or non-subdivision building owners. Different conditions apply to growers with land near schools as well. Pesticide applications are prohibited during school sessions, according to Edwards. Communications with the school are extremely important considering the many extracurricular activities that occur on weekends and after school.

Weed Balancing Act

After all the presentations concerning sulfur management and spraying rotations, Kurt Hembree, UCCE Farm Advisor for Fresno County, had the difficult task of discussing how to balance costs and risks in weed management. There are many weed-related costs, including herbicides, sprayer applicators, mechanical operations, labor and cover crops. There are also just as many risks in weed management including leaching, injury to vines, herbicide availability, poor to erratic control, and market value. To balance out and assess these risks and costs a grower must take precautionary measures. Growers should monitor weeds and identify which types are in their fields. By identifying the weeds, growers can determine both which herbicides will work the best and the susceptibility of those weeds to certain pesticides. A grower should also make sure to properly calibrate sprayers and choose appropriate nozzle selections.

“Correct spraying equipment can reduce the amount of herbicide needed and used in the field,” said Hembree.

In continuing with Hembree’s topic of reduced risks in production practices, Jon Holmquist gave a presentation on the application of reduced risk pest management. Holmquist is a representative of the Canandaigua Wine Company, however he sees himself as more of an ecologist.

“The ecological approach has nothing to do with picking up beer cans,” said Holmquist. “It sees the vineyard as a biological system with plants, animals, microorganisms, soil and air.”

Holmquist said that trying to make the vineyard into a monoculture creates a very unstable atmosphere, but diversity creates stability in the environment. For example, integrating

cover crops into a vineyard introduces predator pests that can help to control vine pests already present. These insect parasitoids and predators also help with nutrient mining or foraging and cover crops aid in dust reduction. Holmquist also recommends predator refuges. Many owls and bats are insectivorous and can help to make a dent in the insect population.

A Sustainable State-Wide Program

The Lodi-Woodbridge winegrape commission has a sustainable farming program that the state is trying to implement into grower production practices. Cliff Ohmart, research and IPM director for the commission, gave an overview of the project that is coming next fall. The program serves winegrape growers and winemakers by providing information about all aspects of winemaking, growing practices and product quality. The project, headed by the Wine Institute and the California Association of Winegrape Growers, hopes to establish the wine and grape community as leaders of the environment and sustainability. Growers implementing this project can expect to be in the position to take advantage of emerging trends in the industry. The project is based on a guidebook that involves grower self-assessment. In it growers identify areas of good farming practices in their operation as well as areas that need improvement.

“The guidebook shows growers what specific issues they need to take action on,” said Ohmart.

The project is implemented through grower-run workshops. A grower hosts a workshop inviting five to 10 other growers, and together they go through the entire process outlined in the guidebook.

Following the seminar, attendees took a short drive out to the Fresno State vineyards where equipment demonstrations and discussions were being held. The latest in air-spraying systems and low-volume sprayers were on display. Each implement was designed to reduce the amount of chemical agents wasted in the field from inaccurate spray applications. The new implements sent the message that sustainable farming practices are becoming more and more prevalent and are no longer the exception to the rule.

Neighbor Outreach – It's Your Responsibility

BY Joe Browde, Project Coordinator
California Winegrape Pest Management Alliance

It's no mystery that agriculture today differs from that of even a few years ago. For example, urbanites are rapidly moving into rural areas, increasing points of conflict often resulting from lack of knowledge and misunderstandings.

Although winegrowers are increasing uses of practices that minimize risks and preserve natural resources, this kind of information isn't well known by the general public. Growers today should take the initiative to be their own spokesperson, reaching out to improve understandings and relationships with neighbors. Here are suggestions for doing this:

- Talk to neighbors, be considerate and courteous. Share the history of your farm and why you enjoy farming. Provide an overview of vineyard practices and challenges. Enlighten them to how you care and act to protect humans and the environment. Anticipate questions and prepare answers before asked (e.g., dusting sulfur).

	Question	Answer
What?	Is being applied?	Sulfur dust. Sulfur is approved for use on organic vineyards.
Why?	Is it applied?	Sulfur prevents powdery mildew on the grapes.
How?	Will it be applied?	It is applied with a dusting machine pulled behind the tractor. We have bought a special machine that can be turned off at row ends.
When?	Will it be applied?	Applications start in April and re-occur every 10-14 days through June. An index based on weather is used for scheduling. We dust at night because of less wind.

- Notify neighbors in advance of operations that may cause concern or interest, e.g., dusting, spraying, and harvesting. Tell them the likely interval for the work and changes in scheduled operations and why (e.g., too windy, too wet). Make compromises for simple requests but don't make promises you can't keep.
- Consider providing your contact information. Often, it is better for neighbors to first contact you with questions or concerns before the agricultural commissioner or police. Promptly return phone messages. Most problems can be resolved through reasonable explanations or apologies if warranted.
- Lower vineyard noise by limiting numbers of tractors in one field, buying relatively quiet equipment and keeping it in proper working order, having employees park cars away from residential areas and talk quietly during late night/early morning, and filling tanks away from neighborhoods.
- Actively participate in neighbor and community meetings, forums, and groups. This shows your commitment to the betterment of the community and enables you to affect perception and policy.

- Consider inviting neighbors to your vineyard for discussions and tours. Schedule events prior to intense activities to subtly alert them and secure their understanding and cooperation. Inviting them to a post-harvest celebration shows your appreciation for their support. Share wine and food, if feasible.

Neighbors can be your biggest headaches or greatest fans. Most conflicts arise out of lack of knowledge. Be proactive and communicate with your neighbors now even if no problems exist and ensure your reputation as good stewards of the land and role models for the community. You will be surprised with the results.

Pest Management Seminar and Field Day Held

By Rhonda Hood

NCW Vineyard Quarterly – Summer 2002

A pest management seminar and field day for grape growers and pest control advisors was held Wednesday, May 29, at the historic Brutacao Plaza in Hopland. Sponsors were the North Coast Winegrowers (NCW), Brutacao Plaza, Crushed Grape Restaurant and the California Association of Winegrape Growers.

Topics included regulations and decision making for farming at the urban edge, powdery mildew modeling and management, grower experiences and perspectives on reduced-risk weed/pest management and good neighbor relations, and an update on the Winegrape Pest Management Alliance (PMA).

Speakers included Joe Browde, project coordinator of PMA; Toni Linegar, Assistant Ag Commissioner for Lake County; Glenn McGourty, University of California Cooperative Extension; Ulysses and Greg Lolonis, Lolonis Vineyards; Mark Pasternak, Devil's Gulch Ranch; and Jon Kanagy, Nord Coast Vineyard Services.

There were also field demonstrations of weed management tools and low-drift sprayers.

This seminar was a part of the Pest Management Alliance whose overall objective is to develop and execute a statewide program on winegrapes to demonstrate and improve outreach on sustainable sulfur application and reduced-risk weed management strategies.

Vineyard Team Crosses Language Barrier

By Raven J. Railey

The Tribune, June 21, 2002

Looking to expanding its outreach and target the swelling ranks of Spanish-speaking vineyard workers, the area's leading environmental grape-grower organization is offering meetings and materials in their native tongue.

"We've found the Spanish-speaking workers are starved for information and are interested in training, learning more and doing a better job," said Kris O'Connor, the Vineyard Team's executive director. "It's a very exciting time for us because we're able to reach people we haven't reached before."

The group is in the process of translating its educational materials into Spanish, including its Positive Points System, a questionnaire used by growers to assess the sustainability of their vineyards.

A clear indication of the need was the attendance at the group's first Spanish-speaking educational meeting – the topic was sulfur – held in February, O'Connor said. There were more than 100 people there, by far the most they've attracted.

To build on that auspicious start, the team is organizing two series of meetings next month on irrigation and pest management. Both will give participants the chance to learn through hands-on demonstrations.

Led by Monica Barricante, an irrigation specialist with Cachuma Resource Conservation District, the irrigation meetings will focus on troubleshooting system problems to keep them working properly.

The pest management classes will be taught by an entomologist and biologist. They will show participants how to identify and deal with different vineyard insects that are both harmful and beneficial to vines, as well as discussing other vineyard diseases such as powdery mildew.

For each topic, the Vineyard Team will hold five meetings – one in Paso Robles, two in Santa Barbara County and one in Monterey County.

While that seems like an ambitious undertaking, O'Connor believes it's important to make the opportunities available in all areas the group covers. "People in Edna Valley don't go to Paso meetings and vice versa," she said.

The dates of the various meetings have not yet been set. For more information, contact the Vineyard Team at 434-4848.